

**A COMPREHENSIVE REVIEW AND SYNTHESIS OF
HUMAN DIMENSIONS RESEARCH IN NEW YORK**

by

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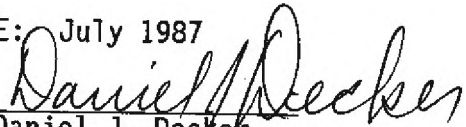
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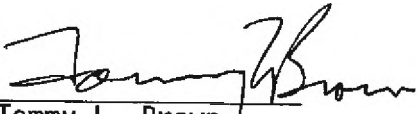
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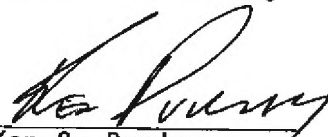
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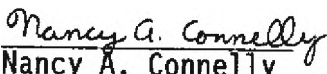
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A COMPREHENSIVE REVIEW AND SYNTHESIS OF HUMAN DIMENSIONS RESEARCH IN NEW YORK:*

Executive Summary

The human dimensions information needs of the New York State Department of Environmental Conservation (DEC) for its wildlife management activities have grown markedly over the past 15 years. Although the agency had supported human dimensions research (internal or contract) intermittently in earlier years, during the mid 1970s commitment to this area of inquiry reached the point where an on-going Federal Aid Project (W-146-R) was initiated under contract with the Human Dimensions Research Unit (HDRU), Department of Natural Resources, New York State College of Agriculture and Life Sciences, Cornell University.

The contractual relationship between DEC and HDRU has been productive. Work partially or fully supported by DEC has resulted in 21 reports and 32 papers for journals, conferences, and the like. This long-term and significant level of support has placed DEC as the national leader in human dimensions of wildlife in both the breadth and depth of inquiry undertaken.

Despite the generally positive reception of human dimensions information by DEC wildlife managers, and the growth in demand for such information by these wildlife professionals, agency administrators have been concerned about full information utilization. The volume of information available could in itself be a hindrance to wildlife managers' understanding and use. Project W-146-R staff were asked to synthesize the majority of the research conducted thus far into one comprehensive report. This report is such a synthesis.

We have organized the report into 4 conceptually and managerially relevant areas of inquiry: hunting participation, hunting access, tolerance of wildlife damage, and communication and education. We have developed conceptual models for each of the 4 areas that depict our organization of findings and understandings.

Hunting Participation

Project W-146-R research has repeatedly found that the most important factors influencing initiation, continuation and desertion from hunting are social-psychological in nature. Resource-related reasons (e.g., access, game abundance) are seldom sufficient to motivate participation or nonparticipation

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among people who have exhibited interest in hunting, such as attendance in a hunter training course or prior license purchase (i.e., our typical sources of sample lists).

We believe that individuals are motivated to behave in certain ways in order to meet their personal goals. For hunters, a trichotomy of goals seems to be most common--demonstrating to oneself or others some level of achievement in an activity; strengthening or maintaining an affiliative tie with a significant individual(s); and fulfilling some need or desire to enjoy nature, participate in the natural system of predator-prey, maintain an American tradition, or some other appreciative aspect or attribute of hunting. Involvement in hunting as a way to fulfill these goals depends partly on personal (internal) influences such as beliefs, values, and perceived ability. Involvement in hunting is also strongly affected by external social influences, such as the expectations of others, commitment to others, custom, and the degree of support from others to participate. All of these are tempered by the importance an individual places on each influence. Given the cumulative weight of such factors and the right situation, an individual makes a decision to learn more about hunting, to try it for awhile, to adopt it as a regular recreational pursuit, or to reject the whole notion. We have called this the *hunting adoption process*.

Thus, we developed a model of involvement in hunting as a process that occurs over time and involves a series of decisions. It is a process of trying hunting, identifying with it, and perhaps adopting it as an effective means of meeting some basic goals. If hunting is adopted as a recreational activity, involvement can deepen over time. In fact, changes often occur in the nature of involvement over time, a phenomenon we have called the *involvement maturation process*.

Understanding the conceptual model of hunting involvement helps in interpreting the impacts that pertinent social and demographic events and trends may have on current and future hunting populations. Our assessment is that if left without a powerful intervention, the population of hunters will decrease significantly over the foreseeable future. Several specific findings and broader societal trends in combination, considered in light of the model of hunting involvement and participation, leads us to this prognosis. They are as follows:

- 45% decline in hunter training course participants (the pool of recruits for hunting) since 1981

- . trend toward older average age of recruits together with finding that people initiating hunting post-adolescence have twice the desertion rate of younger recruits
- . hunting has not attracted increased numbers of women, possibly the largest pool of potential recruits
- . trend toward increasing urbanization of the New York State population (i.e., continued increase in the nonrural population of New York as a percent of the overall population)
- . continuing increase in amount of rural land posted
- . trend toward greater proportion of new hunters originating from nonrural population, a group with a markedly lower "survivorship" in hunting
- . greater proportion of nontraditional family structure--single parent, typically female head of household, lack of male role model (i.e., parent with greatest probability of being a hunter is father)
- . greater activity and visibility of the animal-rights movement

Although it is impossible to give precise predictions of hunting involvement in New York for some future date, we believe that the implications about hunting influences and sociodemographic trends lead to a prediction of considerably lower level of participation in years to come. However, such projections assume no programmed intervention. The model of hunting involvement has many implications for intervention strategies to at least improve survivorship of recruits, which eventually would lead to a dampening of the trend in declining participation. Specific suggestions for programming are given in the text.

Hunting Access

Access to suitable game habitat is a basic hunting requirement and one that DEC and organizations interested in hunting have had great interest in for at least 4 decades in New York. The majority of quality game habitat in New York is on private lands. For this reason, substantial efforts in both research and agency programming have occurred over the years to try to maintain sufficient hunting access on private lands.

It is important to review what we have found from Project W-146-R and other access-related studies in the context of New York's legal framework regarding access to private lands for hunting. Within that context some weighted combination of landowner values, beliefs, and attitudes about hunting, hunters, and access determines the policy that each landowner adopts toward

permitting others to hunt on his/her property. Through an imperfect communications system, landowner access policies may be actively communicated, passively communicated, or not communicated to hunters. Based on these communications, in combination with laws as hunters understand them, hunters form perceptions of whether it is appropriate for them to hunt, or to seek permission to hunt, on specific private lands. Hunters then take particular actions (including not to hunt), which in turn become factors that influence landowner attitudes.

The factors that influence landowner values, beliefs, and attitudes about access include their perceptions of hunter behavior, their own interests in and uses of their property, liability concerns, and their attitudes about hunting. Landowners' perceptions of opportunities to derive income from hunting may also affect their access policies. The amount of wildlife damage incurred by landowners influences access policies when hunting is viewed as a way to alleviate damage.

It is important to separate the concepts of posting and access despite the moderate degree of correlation between them. It can be argued persuasively that New York laws encourage posting; posting is a legitimate means, and the primary legal means, for landowners to control or regulate who is on their property and when. The majority of landowners who post allow some hunting on their property.

In 1980, about 50% of New York landowners posted their lands. Higher proportions posted in southeastern New York and in the Rochester area. Posting rates in the other areas of the state generally were in the 40% to 50% range. The rate of increase in posting appeared to be at its lowest level in 2 decades, possibly because of the decrease in snowmobile registrations statewide.

Although the majority of all landowners and even the majority of landowners who post allow some hunting (65%), less than half of all landowners will allow strangers to hunt. Studies in western New York indicate that 40% to 50% of farmers allowed strangers to hunt. In the Hudson valley, only 25% of farmers allowed strangers to hunt. Thus, hunters who go to other regions of the state to take advantage of special or different seasons may have difficulty finding a place to hunt. In 1976 we found that roughly one-fifth of hunter days statewide involved trips where the specific destination was not known in advance. On such trips, 69% encountered some type of access problem. We also

found that most hunters would seek the landowners' permission if they saw posted lands where they would like to hunt. Other studies suggest that access problems are not among the most important or first-order reasons why people stop hunting (such reasons tend to be social in nature). However, the hunter access study did conclude that lack of better access reduces the number of days active hunters spend afield. Thus, access problems may be a longer term contributing factor to those social factors that in aggregate cause attrition in hunting.

In addition to the traditional type of access to private lands that DEC has been concerned with for decades, a new access dimension has recently surfaced in Project W-146-R studies. Numerous younger people who have taken the hunter training course (HTC) in recent years but who have not begun or continued to hunt have indicated that the distance to suitable hunting sites was too great. This was particularly true for those who lived in the metropolitan New York City area, but up to one-fifth of HTC graduates in other areas indicated there were not enough places to hunt nearby.

New York has a long history of working to improve hunting access problems. The initiation of the access permission symbols program several years ago opened a new era of access communications that was greatly needed, and for which there are still many opportunities for further progress. The difficulty young hunters reported in finding places to hunt suggests that a program to assist these individuals in reaching hunting resources may be advisable. It is possible that such a program would have some goals in common with other programs now being contemplated to encourage hunting participation.

Tolerance of Wildlife Damage

Using damage tolerance information as a factor in setting wildlife population management objectives is a relatively new practice among wildlife management agencies in this country. Most studies and applications of damage tolerance research have occurred in the last 10 years. DEC pioneered the systematic identification and incorporation of such factors into deer management planning in the mid 1970s, using data on farmers' attitudes about deer damage provided by Project W-146-R. Research techniques developed in these deer damage tolerance studies have since been used to assess other damage tolerance situations in New York, including those pertaining to black bear, beaver, and deer damage in suburban areas.

Tolerance of wildlife damage by farmers, landowners, and residential property owners is an important consideration in setting population management objectives for some species such as white-tailed deer, black bear and beaver. Factors and relationships influencing tolerance of wildlife have been identified and described. Basically, an individual typically has pre-existing favorable/unfavorable beliefs and attitudes about a species of wildlife. If the individual experiences some type of damage from a species, he is likely to form a specific attitude of tolerance or intolerance toward the species in that situation. This tolerance level will be strongly influenced by the existing set of beliefs and attitudes, or personal frame of reference, for an individual. Specific attitudes toward the species and the damage it causes, along with other relevant beliefs and attitudes, combine to guide the individual's behavior regarding damage (i.e., damage control measures taken). This behavior may also be influenced, or mediated, however, by a number of external factors (e.g., social pressure, skill, opportunity). Knowledge of such influences is important for effective management programs to prevent excessive deer damage.

As wildlife management agencies make decisions about species-population levels, they need to monitor the needs and preferences of effected publics. This information, along with the necessary biological data, allows the responsive agency to adjust its species-population-management objectives to reflect contemporary social concerns and constituency preferences. Achievement of those objectives is often dependent upon effective public management--influencing individuals' behavior through regulation, communication, and education. Regulation (e.g., harvest quotas) is a direct and documentable approach to effecting changes in wildlife population and damage levels. Indirect mechanisms of communication and education also are of importance. Education may focus, for example, on correcting inaccurate beliefs and helping people acquire skills to address their damage problems. Communication programs can inform publics about how their needs and preferences were considered in setting management objectives and the degree to which those objectives were met.

Communication and education programs, and the effects of species management programs, provide the public with a source of feedback, and complete the cycle of agency/public interaction. As public opinion or wildlife populations change, mechanisms of sustained agency/public interaction become

vital processes in effective wildlife damage management and in wildlife population management generally.

Our studies have indicated that human tolerance of wildlife damage occurs within a specific context of time and place, and typically with reference to a particular species. Attitudes about a certain species influence one's level of tolerance in a particular situation. For example, most landowners are willing to incur some damage from deer because they enjoy the presence of deer on their property. However, some important subgroups such as fruit growers have markedly less tolerant attitudes than the norm.

Investigations of the influences of tolerance within and between constituencies have demonstrated that additional factors intervene within specific contexts to influence wildlife-damage-tolerance attitudes. Such intervening influences may include perceptions of: the type of damage, amount and severity of damage, ability to withstand the economic consequences of damage, and social or peer pressure to express certain attitudes relating to wildlife damage.

Some specific relationships regarding damage tolerance are as follows:

- . Tolerance decreases as perceived amounts of damage or severity of damage increase.
- . Among farmers, those who derive a high percentage of their income from farming, especially fruit growers, are usually less tolerant of deer damage.
- . Thresholds of tolerance of wildlife damage appear to be specific to situation as well as to constituency; that is, although different constituencies may experience similar perceived levels of damage, they often express dissimilar levels of tolerance (at least when measured from an economic perspective) of that damage.
- . Farmers who are hunters are usually more tolerant of deer damage than farmers who do not hunt.
- . Landowners' perceptions of recent numerical trends in wildlife populations, while not always accurate, are often positively associated with the amount of damage incurred. Their preferences for future wildlife population levels often are negatively associated with both their perceptions of damage and recent population trends.
- . Tolerance of deer in rural areas is typically influenced by agricultural damage concerns whereas tolerance in suburban environments is influenced more often by perceptions of the potential health and/or safety risks associated with deer.

Studies in New York and elsewhere provide a data base from which human thresholds of wildlife damage tolerance have been explored. The data yield

insights on several factors that influence tolerance to wildlife damage including: landowners' perceptions of damage amounts and severity, attitudes toward existing wildlife population levels, and preferences for future population levels.

Damage tolerance appears to differ with: (1) the values of the individual affected (e.g., those with high ecological, educational, and appreciative values of wildlife are usually more tolerant of damage), (2) the perceived amount of damage (e.g., as damage increases, tolerance decreases), (3) and the perceived impact on income (e.g., as income derived from the land use increases, tolerance decreases). The data indicate that wildlife damage tolerance levels are likely to differ between constituencies, and are also likely to change over time for the same constituency.

Perceptions of wildlife population levels are strongly associated with damage level (e.g., individuals experiencing increasing damage are more likely than others to perceive an increase in the wildlife population). However, studies indicate that most landowners hold inaccurate perceptions of wildlife population levels.

Preferences for future population levels have been negatively associated with both perceptions of the current population and the estimated dollar value of damage incurred. However, studies of human tolerance of deer damage have typically found the majority of landowners either favored keeping population levels stable or having them increase because most landowners do not report having damage.

Perhaps the most important implication derived from the damage tolerance research conducted to date is that in the absence of damage tolerance information, a significant discrepancy may exist between an agency's wildlife population management objectives and the population preferences of a given constituency group. This represents a potential management problem. Therefore, access to current information on the perceptions and preferences of key constituency groups is essential in setting "optimal" population levels. Without this information managers may establish wildlife population levels that exceed the damage tolerance threshold of a key constituency, or if established too low, could unduly limit the benefits other people could be receiving from the wildlife resource.

Communication and Education

Communication and education (C&E) programs are fundamental mechanisms of wildlife management. C&E programs perform an important albeit difficult role in bringing public involvement to decision making and in influencing public perception of and behavior toward wildlife resources and their management. C&E is a responsibility, to various degrees, of all agency staff as they interact with the public and personnel of other agencies.

No comprehensive evaluation of a C&E effort relative to a particular wildlife management program has been undertaken in New York. Without systematic evaluation, the effectiveness of C&E strategies, including cost effectiveness, cannot be assessed. Nor is it possible to identify where substantive improvements should be made in particular aspects of a C&E strategy.

Although Project W-146-R staff have not been involved in a comprehensive evaluation of C&E efforts relative to a wildlife program, many of our studies have had as an objective the collection of data for DEC use in planning a C&E effort. Consequently, we have given much thought to the C&E aspects of wildlife management. Over time we have developed a wildlife communication planning model that depicts the C&E process. The model has 3 general and primary elements: public perception, public response, and agency response.

The public's perceptions of a wildlife management situation are reflected by their support or opposition for management programs. The agency needs to understand this public response to management and the attitudes toward management issues that underlie it to be able to formulate an effective communications and education strategy (one form of agency response) that will address public concerns adequately.

Agency response to a particular situation of public support or opposition can be of two general types: education or communication. These can be planned, based on characteristics of targeted publics, to complement the agency's species-management program response and would be coordinated into a comprehensive management strategy. The educational component would be geared to influence people's wildlife-related knowledge, experiences, beliefs, and attitudes. The communications effort would be designed to influence people's perceptions of the agency and its program. The ultimate impact of a coordinated C&E strategy would be to influence favorably people's beliefs and

image of the agency, resulting in improved attitudes toward management, expressed as support for management.

The overall C&E model is discussed in greater detail in the report and generally represents our current thinking of the C&E process and how it fits into a comprehensive approach to wildlife management. Further research in C&E would be valuable and the conceptual model would help guide inquiry in this area.

In summary, we would like to emphasize a few key points:

- . the traditional approach to C&E, where creating awareness of issues and programs was the goal, has limited success in increasing acceptance of agency programs;
- . in a comprehensive management strategy a C&E program should be designed to complement the resource management program to achieve the agency's goals and objectives; and
- . C&E program evaluation is necessary to determine if C&E programs are favorably affecting the public's perceptions and support for agency programs.

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FINAL REPORT

STATE: New York

PROJECT NO.: W-146-R:12

PROJECT TITLE: Public Attitudes Toward Wildlife and Its Accessibility

STUDY NUMBER AND TITLE: VI - Provision of Planning and Human Dimensions
Research Design Assistance to the Bureau of Wildlife

STUDY OBJECTIVE: To provide assistance to Bureau staff in incorporating human considerations into wildlife management planning and programming.

STUDY NUMBER AND TITLE: VI-5 - Programmatic Implications of Project W-146-R
Wildlife Recreation Research

JOB OBJECTIVES: To synthesize the extensive information base that has accumulated from the recreation research findings of Project W-146-R.

To organize the synthesis of research findings in a manner that maximizes its use by DEC.

To appraise the applicability of theory developed on hunting to other wildlife recreation activities.

JOB DURATION: 1 July 1986 - 30 June 1987

ABSTRACT: The results of over 10 years of human-dimensions research are reviewed and synthesized. Empirical data, relationships, concepts, and theoretical understandings are organized and discussed in 4 topical chapters: hunting participation, hunting access, tolerance of wildlife damage, and communication and education. Information from 21 reports and 32 papers are condensed and synthesized to present a relatively brief state-of-the-art depiction of the topical areas. Each chapter is characterized by a conceptual model that depicts the elements of data and relationships that define the topical area being examined. These models were developed to illustrate the organization of information used in the chapter and they are intended to aid the reader's understanding of the topic.

Chapter One

INTRODUCTION

Background

During the last 15 to 20, years several trends have influenced the science and practice of wildlife management in New York State. Notable among these have been a broadening of public interest in wildlife beyond the traditional activities of hunting and trapping; increased visibility and support for the animal rights movement; increased politicization of wildlife management and the desire among a breadth of interest groups to "have a say" in how "their" wildlife resource is managed; diminished rates of hunting participation (per capita) and associated fiscal support; significant agricultural, forest and home grounds damage caused by wildlife; and public concern over wildlife-borne disease. The nature of these influences have greatly expanded the needs of wildlife managers for human-dimensions information.

Today, more than any other time in the history of the profession of wildlife management, wildlife managers need to have access to current information about the interests, beliefs, preferences, values, activities, intentions, and interactions of key constituencies relative to wildlife and its management. Historically, the human dimensions domain of knowledge has lagged behind the biological/physical domain in terms of methodological development, understanding and application to wildlife management (Fig. 1.1). But this has been changing rapidly. Methodologically, significant progress has been made. Our understanding of basic concepts and relationships in the human dimensions domain has improved greatly in the past 10 years. However, application of this knowledge has been impeded by the lack of synthesis of information.

The New York State Department of Environmental Conservation (DEC) has been a leader in the development of human dimensions research. No other state

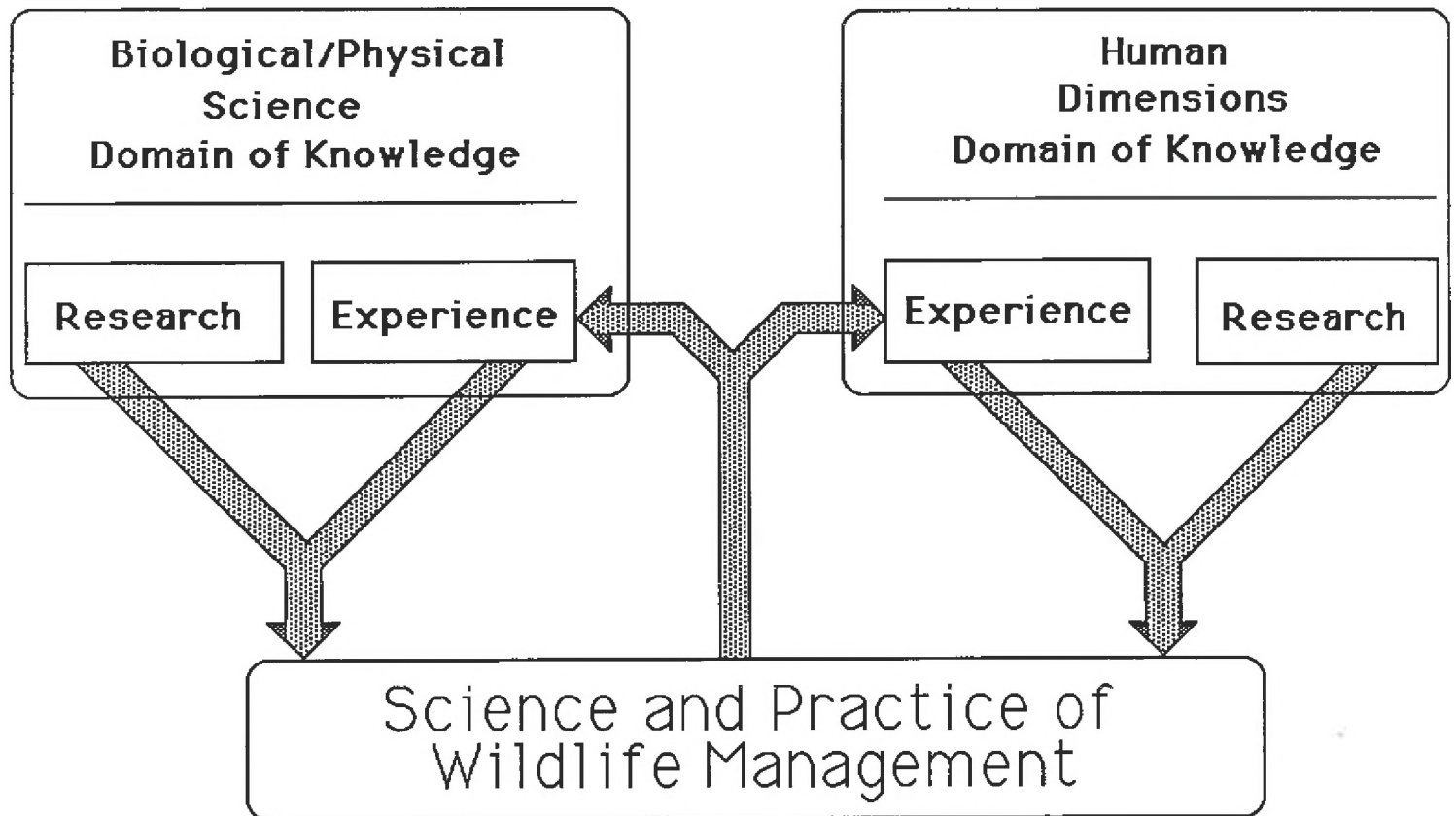


Figure 1.1. Domains of knowledge supporting the science and practice of wildlife management.

wildlife agency has examined the breadth of human-dimensions aspects of wildlife management or has pursued the depth of understanding of these aspects to the extent of DEC through its P-R Project W-146-R contractual arrangement (and related DEC-supported research) with the Human Dimensions Research Unit (HDRU), Cornell University. Nevertheless, even with the commitment and sensitivity characteristic of this agency, the level of general understanding and, therefore, of application of the human-dimensions information to which DEC has access has not been as great as some agency (i.e., Bureau of Wildlife) administrators would hope to have occur. Consequently, Project W-146-R staff were asked to synthesize the majority of the research conducted thus far into one comprehensive but "manageable" report. Following this synthesis effort, Project staff will be seeking input on the best ways to infuse this and future human-dimensions information into the collective DEC knowledge base. That is, we will be asking "How can we facilitate managers' and administrators' understanding and use of the information resulting from specific studies and that form the cumulative body of knowledge that is being generated?" Project staff will be working cooperatively with Bureau of Wildlife staff on this effort during 1987-89 segments of the current AFA (Study IX, Job 4).

Purpose and Overview

The purpose of this report is to present a synthesis of Project W-146-R research to date. We have tried to organize the research into areas of inquiry that are meaningful, both conceptually and managerially.

The 4 areas we selected as organizational foci for this report are:

- . hunting participation
- . hunting access
- . tolerance of wildlife damage
- . communication and education

Probably 90% of our studies are encompassed by these general areas. Where appropriate, we have included relevant findings from Human Dimensions Research Unit studies that were supported by sources other than Project W-146-R. We have also included the work of other human-dimensions researchers when their findings or conceptualizations aid our purposes in this report. This report pulls together the primary findings (data and relationships) and understandings (theoretical and conceptual) from 21 reports and 32 papers largely produced as part of Project W-146-R efforts.¹

We have developed conceptual models for each of the 4 areas that depict our organization of findings and understandings as they are presented in the text. These vary in complexity depending on the extent of our knowledge of the topic and the inherent complexity of the topic. We hope that these schematic representations will aid the reader in developing an understanding of the material discussed in each chapter.

As you read this report, please keep in mind that as with most bodies of knowledge there is more to come. As we pursue future investigations on the subjects covered in this report, we will compare findings and reexamine assumptions and inferences. In many respects, this report represents the state of the art in the human dimensions field of wildlife management--but that field is undergoing rapid development. We will continue to try to do our part to keep New York on the "cutting edge" of that field from the research standpoint. However, it is up to you to keep in the lead in the application of such research outputs for improved management of wildlife. We need your suggestions on how to help you make better use of the information in this and future reports.

Endnotes

1. Table 1.1 inventories all of the reports and papers (largely produced as part of Project W-146-R) used in this report. Brief titles are given in the table along with a sequential number which refers the reader to the complete literature citation following the table.

Table 1.1. Inventory of reports and papers used in this report.

Report Titles	HUNTING PARTICIPATION	HUNTING ACCESS	WILDLIFE DAMAGE	C&E
1. Image Study. 1976.				X
2. Lake Plains Deer Damage Study. 1977.		X	X	
3. Western Central NY Deer Damage Study. 1978.		X	X	
4. Catskill Black Bear Study. 1979.			X	
5. Eastern Central NY Deer Damage Study. 1979.		X	X	
6. 1978 Hunter Training Course Study. 1981.	X	X		
7. Southeastern NY Deer Damage Study. 1981.		X	X	
8. Upper Delaware River Landowner Study. 1981.		X		
9. Hunting Participation and Satisfaction Study. 1982.	X	X		
10. Reanalysis of Western NY Deer Damage Study. 1982.		X	X	
11. NNY Hunters Study. 1983.		X		
12. Antecedents to Hunter Participation. 1984.	X	X		
13. Resurvey of Catskill Black Bear Study. 1984.			X	
14. Standardizing WAVS. 1984.				X
15. 1978 Hunter Training Course Update. 1985.	X			
16. Central NY Beaver Damage Study. 1985.			X	
17. Deer Damage Severity Zones. 1985.			X	
18. NNY Organization Leaders Study. 1985.				X
19. Suburban Islip Deer Study. 1985.			X	
20. Deer Damage Monitoring Instrument. 1986.			X	
21. Panel Study - I. 1986.	X			

Paper Titles	HUNTING PARTICIPATION	HUNTING ACCESS	WILDLIFE DAMAGE	C&E
22. 1976 Posting Study. 1976.		X		
23. Image Study - A Key to Management. 1976.				X
24. Image Study - M.S. Thesis. 1976.				X
25. Hunting Access. 1977.		X		
26. Controlling Wildlife Damage. 1978.			X	
27. Willingness to Tolerate Deer Damage. 1978.			X	
28. Changing Patterns in Outdoor Recreation. 1979.	X			
29. Hunting in NY. 1979.	X	X		
30. Farmers' Tolerance of Deer Damage - Search Pub. 1980.			X	
31. Hunting Violations and Law Enforcement. 1980.				X
32. Comparison of Farmers' Attitudes Toward Deer Damage. 1981.			X	
33. Residents' Attitudes Toward Illegal Deer Kill. 1981.				X
34. 1978 Hunter Training Course Study. 1982.	X			
35. Attitudes and Values Study. 1982.				X
36. Fruit Growers' vs. Other Farmers' Attitudes Toward Deer. 1982.			X	
37. 1980 Posting Update. 1983.		X		
38. NNY Hunters Study. 1983.				X
39. Farmers' Perceptions of Deer Population Trends. 1984.			X	X
40. Human Dimensions Research in NY. 1984.	X			
41. Hunting Access 1963-1980. 1984.		X		
42. Reanalysis of Western NY Deer Damage Study. 1984.			X	
43. Agency Image. 1985.				X
44. Black Bear Management in the Catskills. 1985.			X	X
45. NNY Organization Leaders Study. 1985.				X
46. Suburban Islip Deer Study. 1985.			X	
47. Stages of Hunting Involvement. 1986.	X			
48. Summary of Wildlife Damage Tolerance. 1986.			X	

Paper Titles (cont.)	HUNTING PARTICIPATION	HUNTING ACCESS	WILDLIFE DAMAGE	C&E
49. Landowner Willingness to Tolerate Deer Damage. 1987.			X	
50. Public Values in Deer Management. 1987				X
51. Valuing Wildlife Book. 1987.	X			X
52. Black Bears and People in the Catskills. In press.			X	X
53. Early Hunting Experiences. In press.	X			

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*Chapter Two***HUNTING PARTICIPATION**Introduction

A primary goal of wildlife management is to provide a variety of benefits and satisfactions to people (Wagar 1966). These accrue primarily from recreational uses of wildlife. Although a variety of such uses has been studied, most investigations to date have focused on recreational hunting. The purpose of this chapter is to take a comprehensive look at hunting involvement that will help us understand people's hunting-related decision processes, from the time interest is first shown in hunting until that interest is lost. Understanding the processes people use in deciding to hunt and the factors influencing these decisions improves managers' abilities to maximize wildlife benefits for people. Thus, this chapter concentrates on improving the usefulness of information on the social values associated with hunting involvement.

Understanding the "whys" and "hows" of people's involvement in hunting is important from policy and management viewpoints. In recent years, human populations have increased, land-use conflicts have intensified, wildlife and other environmental issues have become politicized, budgets have become more austere, and greater attention has been given to agency efficiency and effectiveness. To respond to these concerns it has become increasingly necessary for managers and administrators to know the attitudes, desires, and preferences of the constituencies of wildlife management programs (Mattfeld et al. 1984) and to adapt agency policies about supply to changes in public demands for wildlife resources (Shaw 1974). For this reason, wildlife managers

have increasingly sought information on the human dimensions of wildlife management. The need for human dimensions information has been particularly acute for hunting.

In developing a framework for explaining the process of hunting involvement, we have examined four areas:

1. the goals and circumstances (e.g., social, economic, and physical) that influence the individual's decision to hunt;
2. the role of hunting in satisfying individual needs and desires over time;
3. social factors influencing the acceptability/desirability of hunting;
4. the role of hunting as a social process itself, particularly in relation to family development and peer group identity.

A Framework for Understanding Hunting Involvement

A model of hunting involvement is presented in Figure 2.1. According to this model, individuals try to fulfill certain basic goals. Whether involvement in a particular form of hunting is chosen as a means of fulfilling those goals depends partly on personal influences such as beliefs, values, ability, and the drive or motivation to meet these basic goals. Involvement in hunting is also strongly affected by external social influences including the expectations of others, commitments to others, custom, and the degree of support from others to participate, all of which are tempered by the importance an individual places on these influences. Thus, goals in combination with internal and external influences largely determine an individual's involvement in any particular form of hunting.

Involvement with hunting, however, is a process that occurs over time and involves a series of decisions. That is, it is a process that includes trying hunting, identifying with it, and perhaps adopting it as a means of meeting

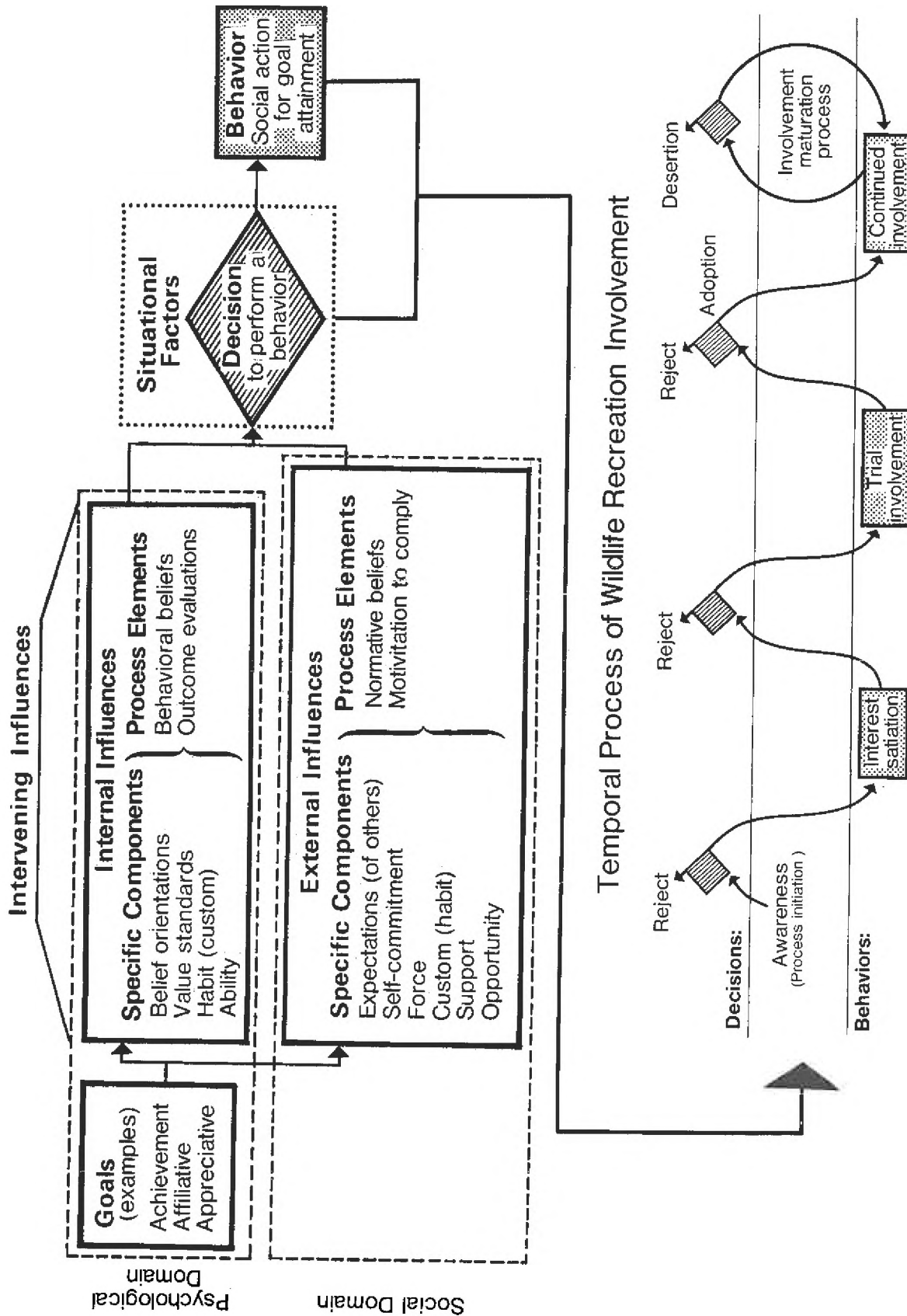


Figure 2.1. Conceptual schematic drawing of the social-psychological process determining hunting behavior.

some basic goals. This process is shown at the bottom of Figure 2.1. The process allows for continued involvement as interest in hunting increases and for adoption if it satisfactorily meets one or more basic goals. Change in the nature of involvement attends continuation following adoption, a phenomenon we have called the involvement maturation process. The process model also allows for rejection or dropping out at any stage if the experience is evaluated to be negative or ceases to meet the desired goals of the individual.

Goals: Antecedents to Hunting Involvement

Responding to the need for a broader understanding of goals and other influences of hunting involvement, Project staff undertook a thorough literature search and a study using in-depth personal interviews of hunters (Decker et al. 1984).¹ We concluded that the majority of specific goals (but not all) for recreational hunting can be combined into three broad categories: affiliative, achievement, and appreciative. These goals had different degrees of importance for different people depending upon the situation. Among the previous studies reviewed by Decker et al. (1984), those of Schole et al. (1973) and Klessig (1970, 1974) presented syntheses that identified these three goal orientations. Furthermore, Kellert (1976, 1980) identified three types of hunters based on reasons for hunting, then characterized the types based on their primary attitudes; these reflected the achievement and appreciative orientations of the goals proposed by Decker et al. (1984). Definitions of the three goals identified by Decker et al. (1984) follow:

Affiliative--Affiliative-oriented hunters become involved in hunting primarily to accompany another person and to enjoy their company or to strengthen/reaffirm the personal relationship between them (during the activity or in planning and recalling the activity experiences).

Achievement--Achievement-oriented hunters become involved in hunting primarily to meet some standard of performance. The specific goal could be a hunting harvest for meat or trophy (exhibition). Sharing accomplishments may or may not be an important aspect of such involvement.

Appreciative--Appreciative-oriented hunters seek from their involvement in hunting primarily the sense of peace and familiarity with the outdoors and wildlife, and the resulting stress reduction that they have come to associate with the activity. Just the recollection of hunting experiences can be rewarding.

We recognize that other goals for hunting participation exist in addition to these three. We also recognize that the three goal orientations could be broken down into more specific categories. (See Knopf [1972] for examples of the motivational determinants of recreation behavior.) Nevertheless, these seem to be three common, though not mutually exclusive, primary goals for hunters in New York.

Social-psychological Determinants of Behavior

Goals spark an individual's behavior, but other influences intervene to determine the particular form of that behavior. Two sets of social-psychological concepts have been used in this portion of our model. These are different yet complementary ways to think about determinants of human behavior. In combination they provide a useful approach to understanding the social-psychological influences on people's involvement in hunting.

The first model (Ajzen and Fishbein 1980) proposes that behavior is determined by a process (Fig. 2.2) having four basic elements:

Behavioral Beliefs--those beliefs that a person has about the desirable and undesirable outcomes of a particular behavior, such as hunting;

Outcome Evaluations--a person's assessments of the worth of the consequences associated with a specific behavior;

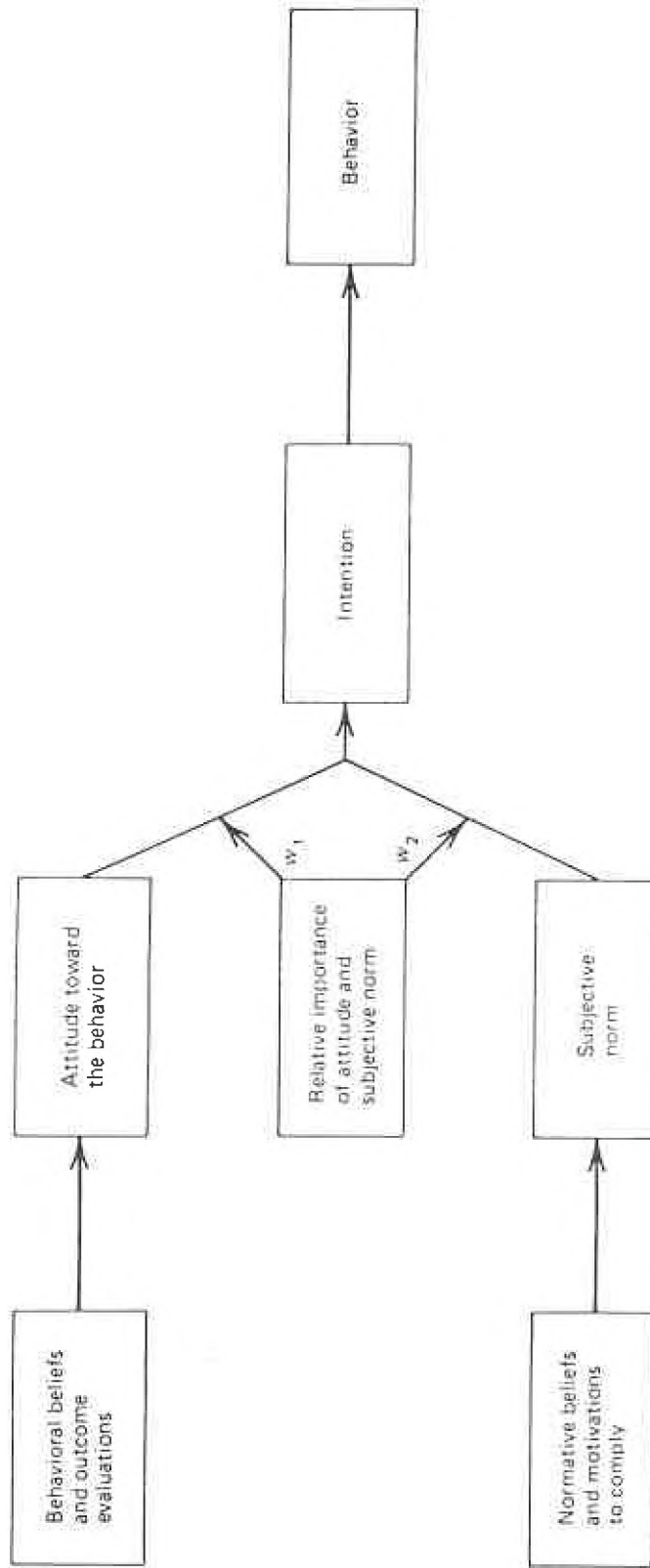


Figure 2.2. Relations among beliefs, attitude, subjective norm, intention, and behavior.

Normative Beliefs--a person's beliefs about whether specific individuals or groups important to him or her think a behavior should or should not be performed;

Motivation to Comply--the degree to which a person is motivated to comply with the wishes of specific individuals or groups.

According to the model, the combination of behavioral beliefs and outcome evaluations explain a person's *attitude toward the behavior* (i.e., hunting). On the other hand, the combination of normative beliefs and motivations to comply explain the effect of external social influences, also called the *subjective norm* pertaining to the behavior (Fig. 2.2). Taken together, the attitude toward the behavior and the subjective norm (each having a relative importance weight in the process) determine a person's behavioral intention, a best estimate of probable behavior.

In a study by Purdy and Decker (1986) using this model, intentions to hunt in New York in the 1985-86 hunting season were found to be moderately correlated to subsequent hunting behavior.² Intentions to hunt were successfully predicted from assessments of attitudes toward hunting and the perceived influence of important social groups. Overall, personal attitudes were more important determinants of intention than social factors.

Evaluations of the beliefs underlying the attitudinal component provided insights into reasons why some persons intended to hunt while others did not. Specifically, people who intended to hunt were more likely than those who did not to believe that positive experiences were associated with hunting and that through their own hunting involvement they would have such experiences (i.e., benefits). Findings indicated that any attempts to change the attitudes of that group who had not intended to hunt would need to focus on making more positive their perceptions of: particular hunting experiences (such as

harvesting and eating wild game), regulating game populations by hunting, and developing traditions of hunting with family and/or friends (Purdy and Decker 1986).

This model is useful for understanding the general social-psychological influences on hunting behavior. However, a more detailed conceptualization can be achieved by bringing in a second model of social behavior developed by Reeder (1973).

Reeder (1973) identified 10 significant social-psychological influences on decisions to perform a behavior such as hunting (Table 2.1). Reeder's model is easily integrated with that of Fishbein and Ajzen to provide more detail. Studies in New York (Decker et al. 1984, Purdy et al. 1985) have shown that the importance people place on the factors in their decisions regarding involvement in hunting vary from individual to individual.

Decisions about behavior are made in a context having at least three areas of influence--social-psychological (everything discussed up to now), opportunity, and ability. Regarding the latter two areas, we are concerned especially with individuals' perceptions of these factors because such perceptions are likely to influence their decisions regarding hunting involvement. *Opportunity* equates with perceived environmental situation, such as access to hunting areas (an external influence), and *ability* equates with perceived physical or physiological situation, such as state of health (an internal influence). Reeder's model also includes the factor of *goals* discussed earlier.

In summary, Reeder's factors provide detail about the specific social-psychological elements underlying a decision to engage in hunting, whereas the Fishbein and Ajzen model helps us understand how these elements work together

Table 2.1. Ten influences of decision making for hunting.

Category of Influence	Examples
1. Goals	Seeking relaxation, or solitude through hunting activity.
2. Belief Orientations	A person's perception that hunting is associated with attributes such as regulating wildlife populations, keeping physically fit, or interacting with nature.
3. Value Standards	One's feelings of "right" and "wrong" associated with aspects of hunting such as killing game animals.
4. Habit and Custom	Continuing a family tradition of hunting.
5. Ability	One's perception of the personal factors influencing their effective participation such as stamina or health, shooting skills, knowledge of game habits, etc.
6. Opportunity	Considerations of factors such as availability and proximity of hunting areas or alternative uses of one's free time.
7. Expectations/ Norms	One's perception of the need to meet the expectations of others, or perhaps their own, regarding their participation in hunting.
8. Self Commitments	One's commitment to act consistently with beliefs, both expressed and unexpressed, regarding their hunting behavior.
9. Force	Physical, verbal, or circumstantial influences of hunting activity such as one's health, threats of reprisal, etc.
10. Support/ Opposition	Perceptions of the existence or nonexistence of support/ opposition from significant sources of social influence.

Adapted from: Decker et al. (1987).

as a system of beliefs-attitudes-behavioral intentions. The entire process is sparked by an individual's goals. To complete this portion of our overall model of hunting participation, however, we need to explain how an individual develops certain values, beliefs, and attitudes that ultimately influence all hunting-related decisions. A plausible and entirely congruent explanation lies in social learning theory.

Social Learning Theory: An Explanation for Formation of Values, Beliefs, and Attitudes Relative to Hunting Involvement

Social learning theory (Bandura 1977) explains how people form the values, beliefs, and attitudes that lead to decisions to behave in particular ways. It helps us understand how individuals weigh the various considerations that go into a decision. The manner in which they are weighed is determined by one's actual and vicarious experience with a certain behavior--a social-learning process whereby people develop their goals, values, attitudes, and so on, by doing and watching others and through verbal and written communication.

The importance of role modeling and social learning to the development of hunting interest was suggested by Schole et al. (1973:245) and, more recently, these concepts were applied to studies of Wisconsin gun hunters (Jackson 1980) and bowhunters (Heberlein 1984). The importance of role models who provide early exposure and participation in hunting-related activities, especially within the context of the family, is that individuals are likely to adopt the hunting values or standards of family members (Decker et al. 1984). Thus, the motivations for early adoption and possible long-term participation in hunting are developed and reinforced.

Empirical evidence of this process has been reported by Purdy et al. (1985) in an analysis of hunting participation trends over a 6-year period.

Six years following participation in a hunter training course in New York during 1978, only 56% of those respondents who were not raised in families where other members hunted and who reported that their hunting interest was self-motivated, continued to purchase hunting licenses. In comparison, nearly 75% of persons who had a family background of hunting and who reported that family members had influenced their hunting interest, continued to purchase hunting licenses. Similar trends have been reported as well from other studies of changes in hunting participation over time (Applegate [In press]).

Assessments of parent/child interactions have provided added insights to the role-modeling process and the importance of a period of early exposure to hunting-related events (i.e., an "apprenticeship" period) (Purdy et al. 1985, Decker et al. [In press]). Those analyses have shown that parents believed that providing early hunting experiences was important to the development of their children's hunting interests and abilities. The benefits that parents hoped their children would receive from these experiences were relatively diverse, ranging from the straightforward acquisition of firearms safety skills (largely through observation) to the complex transmission of values and beliefs about wildlife and the environment, the development of environmental stewardship attitudes, and the strengthening of family relationships. An indication of the influence of family associates was that the benefits parents expected their children to receive were clearly mirrored in the youths' perceptions of the benefits they had obtained from the early hunting experience. That is, the youths recognized that during their apprenticeship they were being exposed to and encouraged to adopt and develop a variety of beliefs, attitudes and skills important to their parents.

Overall, research has shown that persons introduced to hunting in families where it is a tradition typically begin hunting at early ages under the tutelage of their fathers. They continue to exhibit consistent participation as adults. The customs, traditions, and expectations of family are powerful social forces. The direct or vicarious experiences provided by familial role models facilitate the transmission of important hunting values. Persons who lack a family role-modeling experience and are introduced to hunting by friends usually begin participating at older ages. They are at least moderately oriented toward maintaining affiliative ties. These people seldom have internalized important hunting values and are less consistent in their hunting activity.

Regardless of the source, the importance of obtaining positive social reinforcement for hunting participation is evident. Over 80% of New York's new hunters in 1983 reported that all influences on their decision to begin hunting were approving in nature (Purdy and Decker 1986), a finding that suggests most beginning hunters may need pervasively positive reinforcement from all significant social influences to initiate hunting activity.

Understanding the Social-temporal Context of Hunting Involvement

We contend that people's involvement in hunting evolves over time; sometimes adoption of an activity occurs quickly, sometimes it requires many years. Furthermore, an individual's outlook toward the activity may change over time. Thus, we arrive at the temporal portion of the model (Fig. 2.1).

Activity Adoption/Rejection. The voluntary adoption of new ideas, practices, or activities by individuals seldom results from a single, pivotal decision, especially if a significant personal commitment of time or money is required. Rather, a series of decisions leading to increasing levels of

involvement is the norm for most people (Rogers 1962). This concept has been applied to recreation participation generally (e.g., Brandenburg et al. 1982), and we have developed an adoption model to help describe the progression of a person's interest and involvement in hunting specifically (Fig. 2.3). As illustrated, the several stages reflect increasing levels of involvement, from initial awareness of the activity, to gaining interest in it, to actually trying it, and finally to the decision(s) to continue involvement. The model has been used in studies of hunters in New York (Purdy et al. 1985, Decker and Purdy 1986, Purdy and Decker 1986). Findings have generally indicated, as the innovation-adoption theory would predict, that individuals who have not progressed to the continuation stage exhibit the greatest potential to quit hunting. Less frequent intentions of desertion and more frequent intentions of continuation are exhibited among persons in succeeding advanced stages of the adoption process.³ Recognizing these stages is important because it emphasizes that the decision to participate in hunting is rarely spontaneous; it is the product of a sequence of decisions (as depicted by the diamonds in Fig. 2.1) associated with the increasing levels of involvement leading to the end behavior.

Involvement Maturation. The notion of a process of involvement in hunting can be expanded beyond the adoption stage. Considerable evidence indicates that a process of change occurs with continued involvement in hunting. Among the first researchers to examine a developmental sequence for hunting were Jackson et al. (1979). They identified five types of general hunting behaviors that they believed were stages in a social-psychological development process (Table 2.2). Although they hypothesized this to be a process, our observations

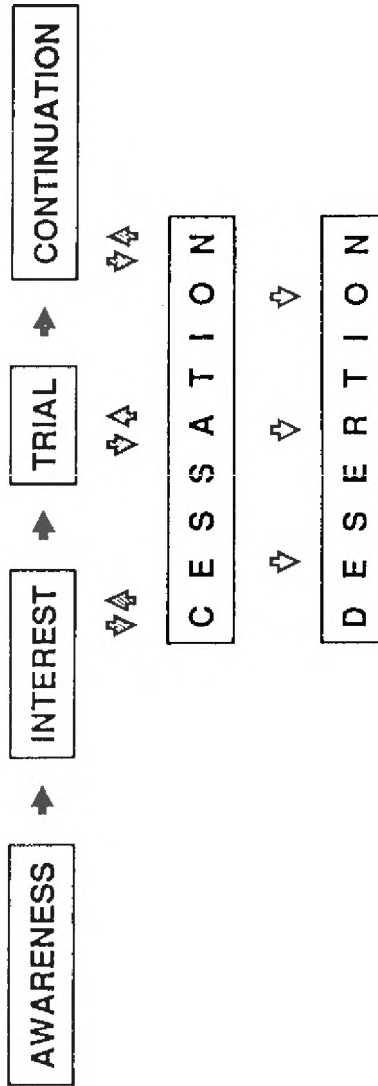


Figure 2.3. Stages in the development of an individual's interest and involvement in hunting.

Table 2.2. Stage descriptions in the Jackson et al. (1979) hunting development sequence.

Shooter Stage	The beginning hunter needs to pull the trigger and test out the capability of his weapon. The type of target is not important.
Limiting-out Stage	The hunter measures success by the numbers of birds or animals shot.
Trophy Stage	The hunter wants to shoot a bird or animal that has definite status.
Method Stage	The hunter usually has all of the specialized equipment associated with the sport. Hunting has become one of the most important dimensions of that person's life.
"Mellowing-Out" Stage	The hunter finds satisfaction in the total hunting experience. There is a breadth of satisfactions available to him.

indicate that these represent types of behavior that are more likely to be situationally determined.

Applegate and Otto (1982) have observed that the five stages proposed by Jackson et al. (1979) are somewhat comparable to Kellert's meat, sport, and nature hunters, in that order. This may suggest that Kellert's typology, developed from a cross-sectional or "slice-in-time" study, may be describing the attitudes of hunters over time as they pass through a "sequence of cumulative experience" (Applegate and Otto 1982:22).

Bryan (1979) also hypothesized the existence of a process of involvement with wildlife, as well as other forms of outdoor recreation. He believed that specialization continua existed whereby outdoor recreationists tended to move from activities of low specialization to those requiring higher specialization. He elaborated on two versions of specialization--within categories of activity and between categories of activity (Fig. 2.4).

Recent studies in New York also have suggested that a change occurs among some hunters over time (Decker et al. 1984, Purdy et al. 1985). However, rather than describing this process in terms of behaviors, as did Jackson et al. (1979) and Bryan (1979), we believe the change to be on the more basic and general level of goals. That is, individuals' behavior may change, but these changes are manifestations of changes in goals. Early investigations suggested that many hunters seemed to shift, at different rates, from primarily affiliative or achievement goal orientations to a primarily appreciative goal orientation (Decker et al. 1984). Later and more comprehensive efforts have shown that these goals coexist in most people and are typically expressed in some combination as basic reasons for hunting but have different degrees of saliency for different people.⁴ Usually, one category is most influential in

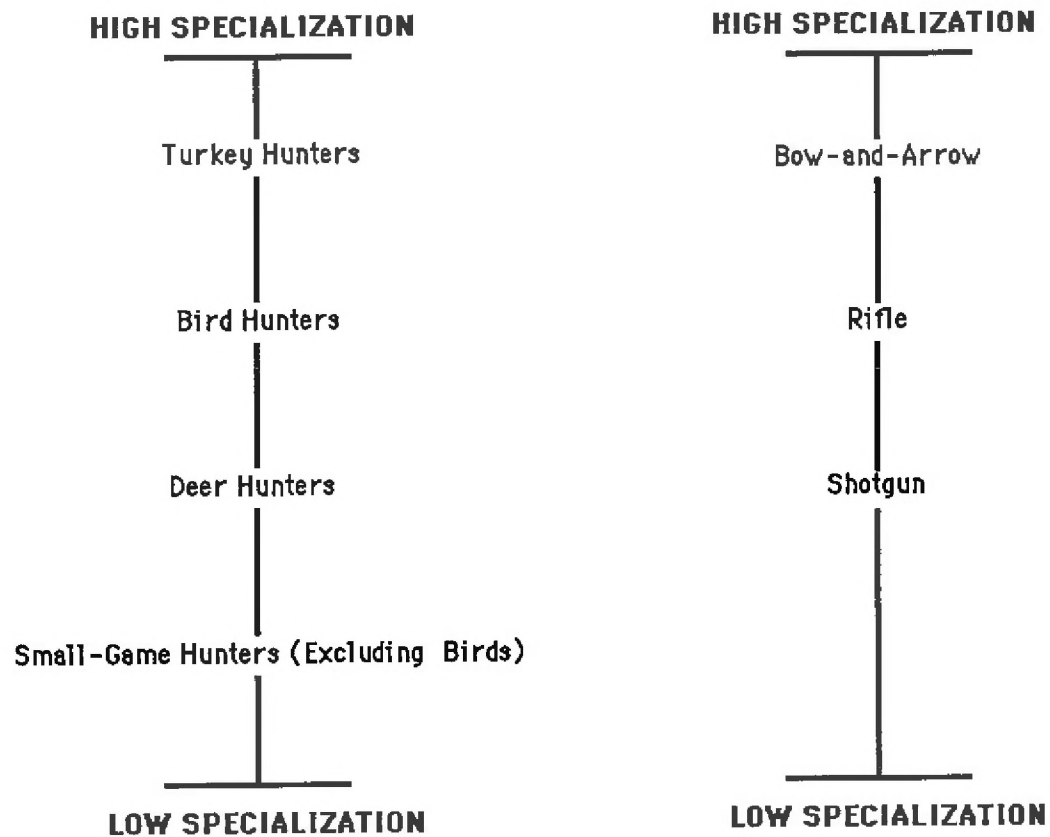


Figure 2.4. Examples of two forms of specialization in hunting--between categories of hunting (left) and within a category (right).

decisions related to hunting involvement at any given time. Motivations to attain appreciative goals were reported to be most important to hunting decisions for beginning hunters, regardless of their age (Purdy and Decker 1986).⁵ Trends across age groups of new hunters suggest that achievement and affiliative goals diminish in importance while appreciative goals strengthen with increasing age. The temporal relationship between changes in intensity of goals and hunting involvement is not yet clear. We suspect, however, that as others (e.g., Jackson et al. 1979) have indicated, the attainment of a significant appreciative orientation is the norm for those with sustained hunting involvement.

Our findings lead us to believe that over time the needs (goals) of many people initially having primarily achievement or affiliative goals for their involvement in hunting are reduced. We believe that the social values of the activity change as well. Some people undoubtedly leave the activity when this "need reduction" occurs, but others continue for other social-psychological reasons (e.g., habit, expectations, commitment) and with an appreciative-affiliative or appreciative-achievement orientation combination. The stages identified by Jackson et al. and the levels of specialization recognized by Bryan may actually be behavioral indicators of these goal shifts. Thus, our overall model includes an involvement-maturation dimension in the activity-adoption/rejection process described earlier.

Application of the Conceptual Framework for Hunting Involvement: The Status and Future of Hunting in New York

The conceptual framework presented herein can serve as a guide for policy makers and managers as they develop and implement hunting programs. Indeed, the studies of hunting participation in New York that have contributed to the

development of the framework have expanded the theoretical and empirical foundation for interpreting the impacts that social and demographic events and trends may have on current and future hunter populations. However, our assessments of what those changes may mean for the recruitment of new hunters and continuing involvement of active hunters are disconcerting.

A Situational Perspective

Desertion rates in New York's hunter population, when considered alone, do not suggest a declining hunter constituency (Brown et al. 1982, Purdy et al. 1985). Recruitment is generally assumed to offset such losses. However, the recent trend in annual participants in New York's Hunter Training Course (HTC) appears to portend a more distressing situation for the "health" of the hunter population in New York. The number of HTC participants, the bulk of annual recruits into the State's hunting population, has undergone a drastic decline of 46% from 1981 to 1986 (Fig. 2.5). When this trend is considered along with other social and demographic trends and the characteristics of new hunters, the future appears even less encouraging. For example, in 1987, the male population of ages 13 through 23, from which New York draws about two-thirds of its hunter-training recruits, is only 88% as large as it was in 1981; by 1993, it will be only 75% as large as in 1981. Furthermore, the age distributions of recent years' HTC participants have shown increasing proportions of older persons initiating hunting, a trend reported for other hunter populations as well (Applegate 1982). Comparisons of these recent cohorts of hunters in New York indicate that the percentage of recruits 20 years of age and older has increased substantially from 30% in 1978 to 43% in 1983 (Brown et al. 1981, Purdy and Decker 1986). Other findings suggest that persons initiating hunting at postadolescence are about twice as likely to desert the activity within a few

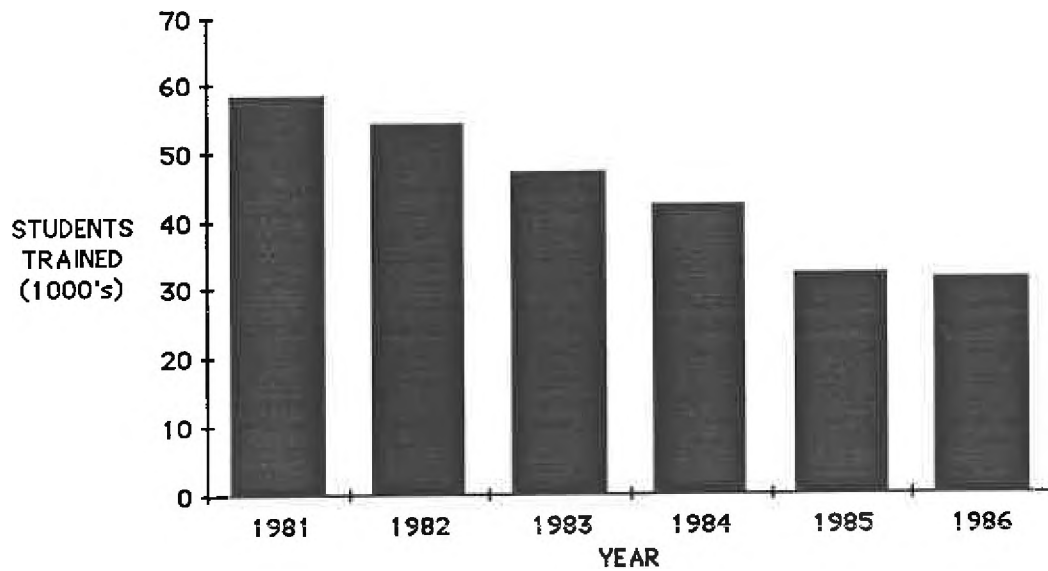


Figure 2.5. Six-year trend in students trained through New York's mandatory Firearms Hunter Training Course.

years of initiation (Purdy et al. 1985). We have also found that many new hunters in older age groups hunt most often with their spouse, presumably for affiliative reasons. Discontinuance of hunting by the primary participant in these hunting couples may often remove two participants. Thus, age-related influences would lead us to expect higher rates of desertion from the most recent groups of hunting recruits than has been the norm in the past, possibly as high as 40% within two to three years after recruitment.

Women continue to be underrepresented in hunting despite the fact that over the past decade women have been adopting most outdoor recreation activities at faster rates than men (Bevins et al. 1979). Little change has occurred in recruitment of women into hunting in New York; female participation levels in HTC's given in 1978 and 1983 were 15% and 18%, respectively (Brown et al. 1981, Purdy and Decker 1986). In fact, the decline in overall HTC participation indicates that the actual number of women recruits has decreased markedly. Given a continuation of this situation, women cannot be regarded as a major pool of potential recruits.

Trends toward increasing urbanization also can be expected to affect hunting participation negatively (Hendee 1969). As suburban sprawl continues, the nonrural population of New York is expected to continue to increase as a percent of the overall state population. Concomitant problems of resource access are perceived by some hunters from nonrural areas to be a limiting factor to their hunting participation (Decker and Brown 1979). The increase in posting of rural lands in New York from 26% in 1963 to 50% in 1980 punctuates the potential severity of this partially real, partially perceived impediment to hunting participation.*

*See also Chapter 3, "Hunting Access."

We anticipate that the trend of increasing recruitment of new hunters from nonrural areas will continue. Between 1978 and 1983, the proportion of recruits living in urban/suburban areas vs. rural areas of New York increased from about one-third to over one-half (Brown et al. 1981, Purdy and Decker 1986). However, the "survivorship" exhibited by these urban/suburban people over a five-year period is markedly lower than that of rural residents. Many of these individuals do not have backgrounds with strong hunting traditions, they begin hunting at older ages, and they have shown higher rates of desertion than rural residents. We believe that opportunities for social reinforcement of hunting participation may be increasingly difficult for these nonrural people who have hunting interests. Few of their neighbors and coworkers are likely to share an interest in hunting. Furthermore, the children of recruits from nonrural areas who demonstrate some hunting interest may be even less likely in the future to have that interest develop into continued hunting commitment, given the various resource availability limitations, alternative recreation opportunities, and social impediments impinging on their hunting participation.

Beyond expected changes in hunting participation related to influences such as age, gender, and urbanization, the changing nature of the family structure has equally ominous implications. The traditional nuclear family that was common in rural areas and that facilitated the transmission of values of which hunting has long been a part, has been rapidly eroding. Nationally, the number of single-parent households has nearly doubled since 1970, primarily due to increasing divorces (Bureau of the Census 1986). In 1985, 20% of the 63 million family households were headed by a single parent, usually a female. Of the nearly 15 million children under the age of 19 living with only one parent,

90% resided with their mothers. These national trends reflect well the New York situation.

For hunting, male role models in two-parent families, especially fathers, have typically served as the providers of information and experience necessary to stimulate children's interest in hunting. Upon loss of the male parent presence in the family through divorce, family interest and participation in hunting is likely to diminish, as is the chance for transmission of hunting values. Furthermore, remarriage poses its own set of problems in relation to hunting. Children of hunting descent with a new nonhunting stepparent may have their hunting interest opposed by the stepparent and/or insufficiently nurtured by the natural parent who hunts. Social learning theory (Bandura 1977) suggests that the likelihood of transmission of the values leading to commitment to recreational hunting in these families is less than in "traditional" families due to restricted reinforcement opportunities. On the other hand, families formed by remarriages in which the stepparent has a hunting background are often faced with pre-established values of nonhunting youngsters that may not be consistent with those most important for hunting.

Concurrent with these "short circuits" in the transmission of social values related to hunting, other external influences are questioning the social desirability of hunting. This is embodied in the animal-rights movement, particularly the antihunting thrust of that movement. New York has recently been the focus of antihunters' attention as demonstrated by the indictment of New York's wildlife management programs, the professional managers who develop those programs, and the hunters who benefit from the efforts (see Ron Baker's

book, The American Hunting Myth).** As we reported earlier, motivations to comply with current social expectations do not appear to be as important as personal beliefs about hunting when individuals decide whether to hunt or not. Nevertheless, from a hunting involvement standpoint, for the growing "at risk" segment of the current generation of youngsters who are not receiving a traditional acculturation to hunting, the antihunting movement presents an important additional impediment to participation. The warning given by Berryman (1987) that the animal rights movement presents one of the two most ominous threats to wildlife management is reinforced by the outlook derived from the trend in social influences related to hunting.

Programming for the Future of Hunting

Although it is impossible to give precise predictions of hunting involvement in New York for some future date, we believe that the implications about hunting influences and sociodemographic trends discussed above lead to a prediction of considerably lower levels of participation. However, **such projections assume a relationship of hunting to future conditions without programmed intervention.** Fortunately, in 1987, agencies and organizations involved in hunting may be in a position to be proactive, and to influence rather than react. The same research that gives us the ability to anticipate how various sociodemographic trends could influence the future of hunting can also help guide the development of intervention strategies to mediate the consequences of such trends. For example, innovative approaches to hunter education that include cognitive and experiential elements (e.g., surrogate

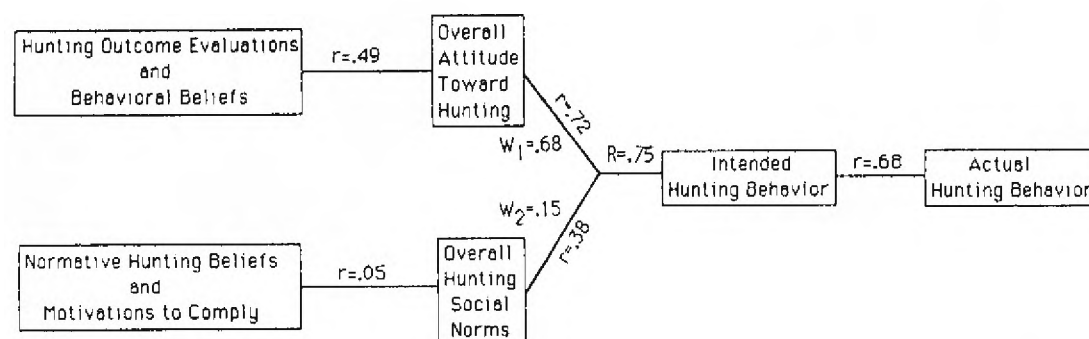
**For an analysis of the content of The American Hunting Myth see D. J. Decker and T. L. Brown, "How Animal Rightists View the 'Wildlife Management-Hunting System'" (in press).

role models providing hunting apprenticeship experiences), which have been suggested in the past (Applegate and Otto 1982, Decker and Purdy 1986), could be adequately designed given the current state of knowledge. Furthermore, efforts to infuse wildlife ecology concepts into public school curricula are needed to ensure that youth acquire an understanding of the basis for wildlife management. These concepts provide the foundation for acceptance of the role of hunting as a tool for wildlife management as well as recognition of hunting as a recreational pursuit that is biologically and socially defensible.

Realistically, even the most successful intervention programs we can envision will not totally offset the trends identified above. However, foreknowledge of the influences of declining hunting participation can allow agency administrators to adjust programs, accommodate declining budgets, and appropriately project demand for resources. To that end, the conceptual model of hunting involvement that we have presented is important. Through its use, wildlife program managers and administrators may benefit from an improved understanding of the degree to which various forms of hunting in particular settings meet the needs of hunters. Ultimately, the hunting public itself will benefit because wildlife programs will continue to be improved to offer a more complete "benefits package" for those interested in enjoying the wildlife resource through recreational hunting.

Endnotes

1. Included among the studies that provide discussions of the factors influencing wildlife recreation decisions and satisfaction are: Kennedy 1970, Klessig 1970, More 1973, Potter et al. 1973, Schole et al. 1973, Stankey et al. 1973, Hendee 1974, Kellert 1976, Brown et al. 1977, Gilbert 1977, Langenau and Mellon-Coyle 1977, Heberlein and Laybourne 1978, Hendee and Bryan 1978, Arthur and Wilson 1979, Faunce et al. 1979, Hautaluoma and Brown 1979, Jackson et al. 1981, Applegate and Otto 1982, Decker and Brown 1982, Decker et al. 1984.
2. Empirical relationships observed between components of Fishbein and Ajzen model when used to predict hunting behavior of New York hunters.



Legend:

r = Simple correlation coefficient (Spearman's rho)

W_{1,2} = Standardized regression weights (Beta)

R = Multiple correlation coefficient

Source: Purdy and Decker (1986).

3. 1978 New York hunter training course graduates' stage of hunting involvement in 1984 and estimated future hunting involvement.

1984 involvement stage	n	Percent in each involvement stage			Total
		Will not hunt	Undecided	Will hunt	
Interest	37	42	26	32	100
Trial	66	19	38	43	100
Continuation	300	3	11	86	100

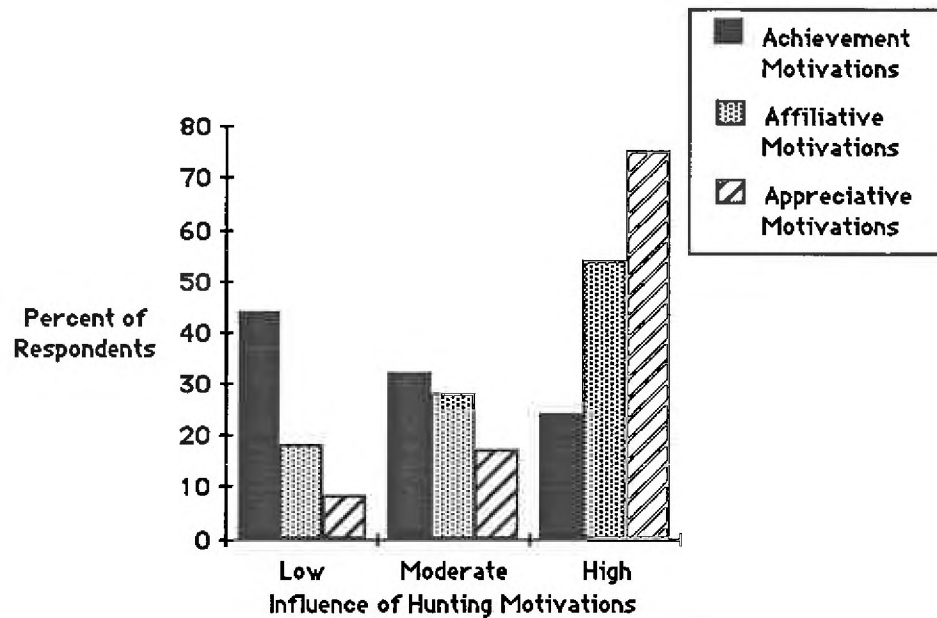
Source: Decker and Purdy (1986).

1983 HTC graduates' perceptions of hunting involvement in 1985 and related hunting intentions.

1985 Adoption Stage	n	Percent in each involvement stage			Total
		Will not Hunt	Will Hunt	Undecided	
Interest	185	15.7	46.5	37.8	100.0
Trial	1017	3.8	75.0	21.2	100.0
Continuation	1340	1.0	93.1	5.9	100.0

Source: Purdy and Decker (1986).

4. Aggregate influence of reported motivations for hunting in 1985 among graduates of New York's 1983 hunter training course.



Source: Purdy and Decker (1986).

5. Primary Motivational Orientations (Goals) in 1985 of a Sample of 1983 Hunter Training Course Graduates in New York.

Age of Hunter	n	Percent Reporting Most Important Goal			Total
		Achievement	Affiliative	Appreciative	
≤15	427	22.5	28.6	48.9	100.0
16-17	760	19.5	27.1	53.4	100.0
18	156	19.9	26.9	53.2	100.0
19-21	199	16.1	25.1	58.8	100.0
22+	1124	9.7	22.2	68.1	100.0

Source: Purdy and Decker (1986)

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*Chapter Three***HUNTING ACCESS**Introduction

This chapter focuses on hunting access to private lands. Like the other chapters of this report, it attempts to first step back from all of the previous studies and resulting data that have been generated and define the "hunting access system" as we see it. We describe the important relationships as we know them, starting at a very general level and then getting more specific. We then indicate what we know about those relationships and what we have evidence of, albeit perhaps incomplete evidence in some cases. Finally, we describe factors or likely relationships for which updated or additional research is clearly needed. It is our hope that some fresh interpretations and new insights of value to both managers and researchers will result from this process.

General Conceptual Model of Hunting Access

At the most general level, consider the hunting access dynamic shown in Figure 3.1. Within New York's legal framework regarding access to private lands for hunting, some weighted combination of landowner values, beliefs, and attitudes about hunting, hunters, and access determines the policy that each landowner adopts toward letting others hunt on his/her property. Through an imperfect communications system, landowner access policies may be actively communicated, passively communicated, or not communicated to hunters. Based on such communications from landowners, in combination with access laws as hunters understand and interpret them, hunters form perceptions of whether it is appropriate for them to hunt, or to seek permission to hunt, on specific

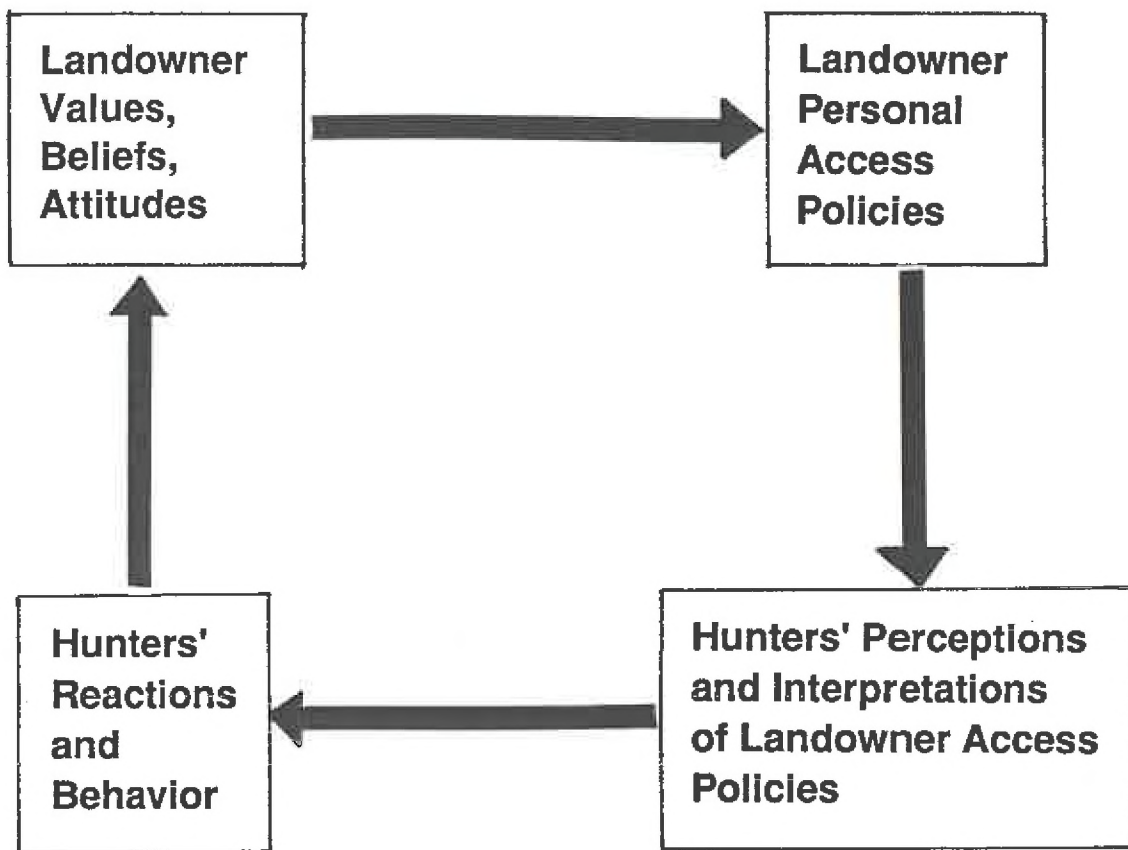


Figure 1. Schematic of hunting access dynamics of private landowners and hunters.

private lands. These perceptions lead hunters to take particular actions (including not to hunt), which in turn become one of numerous factors that influence landowner attitudes.

Each of the 4 boxes in Figure 3.1 needs further development. We see 5 primary domains that influence landowner values, beliefs, and attitudes and thus form the basis for their access policies. The first is landowner beliefs about hunters, both as individuals they may or may not know, and collectively as a group. Our research has shown that these beliefs are formed not only through the direct experience of landowners, but additionally through their perceptions of the experiences of friends and neighboring landowners (Brown and Thompson 1976:123). The second domain is related to personal land-use interests of the landowner. This domain has 2 aspects, recreational and nonrecreational. The 1980 posting study (Brown et al. 1983) indicated that the more active the landowner is in wildlife-related activities on his/her property, the greater the likelihood that he/she will post the property. In addition, previous studies have recorded posting because of nonrecreational uses of the property (e.g., commercial, educational) that the owner believed to be incompatible with hunting.

A third domain that influences landowner access policies is liability. This domain includes more than the actual legal liability that a landowner would have for an injured hunter, or an injury caused to another person or to domestic animals by a hunter. It also includes the threat of being sued, i.e., the psychological stress, lost time and money in preparing a legal defense, and the publicity that accompanies being involved in such an incident.

The fourth and fifth major domains influencing landowner access decisions are ones for which little information exists, but we feel are areas of

increasing importance. Fourth is the opportunity to derive income or other benefits from hunting, which is expected to cause additional landowners to restrict access in the future. Finally, landowner attitudes about the appropriateness of hunting are probably having an increasingly restrictive effect on their access policies.

One can make a case for additional domains such as landowner experiences with wildlife damage exerting an influence on individual landowners' access policies. However, we have only sketchy evidence that others have notable influence on such policies. We will therefore concentrate on the 5 aforementioned domains.

The access policies that landowners adopt as a result of the influences of these 5 domains include both posting behavior and access behavior. Landowners' decisions as to whether to allow hunting, to whom, and to how many they will grant hunting privileges is important in terms of meeting the demand for local or regional supplies of acreage where habitat of acceptable quality is available for hunting particular game species. Posting behavior is important both in terms of the degree to which it is correlated with access behavior and in terms of how it is interpreted and reacted to by potential and active hunters. We feel that it is critically important that posting and allowing access not be viewed synonymously. Each study in New York that has inquired into access-related behavior has found that the majority of posting landowners allow some hunting. On the other hand, some landowners who do not post nevertheless do not want hunters on their property.

The perceptions, interpretations, and reactions of hunters to landowner access policies, together with the subsequent behavior of hunters, need to be examined for several groupings of hunters. How do potential hunters, new

hunters, and more experienced hunters react? Among potential hunters and new hunters, how do those from hunting families versus those who lack such backgrounds, and those from rural versus urban areas react? For what hunter groupings are desertion due to real or perceived access shortages most prevalent?

The 5 domains discussed above will be used as a framework to focus a summary of our knowledge about hunting access in New York. The following sections examine each of the corresponding sections of Figure 3.1 in greater detail.

Landowner Values, Beliefs, and Attitudes

Landowner Perceptions of Hunter Behavior

The importance of hunters' behavior, as perceived by landowners, as an influence on landowners' access policies was examined most thoroughly in the 1972-73 posting study (Brown and Thompson 1976)¹. At that time, 55% of posting landowners indicated that they had encountered bad experiences with recreationists. Although hunters were the leading category of recreationists to which such experiences were attributed, only 31% of posting landowners had personally encountered such an experience with hunters. However, 12% knew of a friend or neighbor who had a bad experience with hunters, 36% felt endangered by hunters on their land, and 16% reported that the reputation of hunters was a reason for posting. Overall, 97% of posting landowners indicated 1 or more of the above reasons pertaining to recreationists as an incentive for posting. A strong relationship existed between posting and landowner perceptions of hunters' behavior; 71% of posting landowners characterized hunters as being irresponsible, compared to only 26% of nonposting landowners. Other indicators of landowner perceptions of hunter behavior include the 1982 survey of farmers

in western and central New York and the 1981 survey of farmers in southeastern New York. Over 40% of farmers in western and central New York reported problems with hunters, but only 10% of farmers termed the problems "substantial" (as opposed to "minor") (Decker et al. 1982). About 58% of farmers in southeastern New York reported problems with hunters; 14% of farmers reported "substantial" problems (Decker et al. 1981).

Property-use Interests of Landowners

Past studies indicate that a very small percentage of landowners posts or restricts hunting because of nonrecreational uses of the property that are incompatible with hunting. Thus, this section focuses on recreational interests of landowners and the relationship of those interests to access.

The 1972 posting study indicated that the incidence of participation in recreation activities for posting versus nonposting landowners did not differ significantly for most activities. Only for hiking and nature study did significantly more posting than nonposting landowners participate (Brown and Thompson 1976:125). However, in the 1980 study, significantly more posting than nonposting landowners participated in hunting, trapping, birdwatching, and wildlife art/photography. Furthermore, the likelihood that landowners posted increased with the number of activities they participated in. Landowners who were active in the management of their forestlands also posted at higher rates than other landowners in 1980 (Brown et al. 1983).

Liability Concerns

Liability concerns have never been found to be a primary reason for posting and restricting access. Indeed, New York's General Obligations Law does a great deal to minimize the liability of landowners who admit hunters and

many other recreationists free of charge. Yet, from discussions with landowners at educational sessions sponsored by Cornell Cooperative Extension across New York, we believe that liability concerns remain an important second-order concern of landowners that may be increasing as liability suits become more frequent. We have no recent data on this topic but we have definite hypotheses based on numerous interactions with landowners through Cornell Cooperative Extension.

The ownership of rural lands has changed substantially in recent decades. Many nonfarm owners (who own the majority of rural lands in New York) are no longer traditional residents with rural backgrounds who grew up in hunting families. This new genre often perceive hunting as a dangerous activity. They can easily connect the activity with the potential for lawsuits and the huge awards that frequently accompany them today (although there is no factual basis for this perception in relation to hunting). Therefore they take actions that they feel will guard against the risk of an accident, including limiting hunting access. Many landowners are not aware of the limited liability statute despite considerable educational programming by Cornell Cooperative Extension and DEC over the years. However, even landowners who are aware of the statute express some concern over the fact that they have a very limited duty to protect people using their land, including trespassers, from some man-made hazards. Although some landowners would agree that the intent of the law and previous court interpretations are fair, they harbor some anxiety that the general liability crisis in America could easily spill over into the arena of recreational access. One aspect of this is the realization that anyone can sue or be sued, and that relatively minor suits are sometimes brought by plaintiffs in hope that the defendant or his/her insurer will assume the damage costs out

of court, regardless of legal liability, rather than face the time, expense, and notoriety of a full court hearing.

Opportunity to Derive Income from Hunting

It has been assumed previously that relatively few landowners charged fees for hunting, either due to lack of interest or perceived lack of opportunity. Thus, the degree to which landowners have interest in leasing or other fee mechanisms for hunting and the degree to which landowners charge for hunting privileges has had little empirical attention.

In 1974 the USDA Agricultural Stabilization and Conservation Service (ASCS) conducted a pilot program in 5 counties of New York (Broome, Cayuga, Delaware, Niagara, Orleans) in which participating farmers received a cash payment for allowing hunting on their lands. This program was not coordinated with DEC; the counties and properties chosen did not reflect areas where it had been predetermined that additional access was needed. A Cornell survey of farmers who participated in the program and nonparticipating landowners with adjoining lands (who may or may not have been farmers or affiliated with ASCS programs) provided some indication of attitudes about compensation for hunting privileges (Brown and Dawson 1977). One-third of the adjacent landowners had no interest in being compensated. About 28% felt they should be compensated directly by hunters, while the remaining 39% felt they should be compensated indirectly by government programs. Most participating farmers (62%) preferred indirect governmental compensation such as they were receiving from ASCS; 16% preferred compensation from a combination of governmental programs and directly from hunters; 15% felt they should be paid directly by hunters; and only 7% indicated no desire for compensation. Given the increased economic hardships faced by farmers today, feelings toward the need for additional nontraditional

income sources such as those that could be derived from hunting (regardless of the particular mechanism) are probably stronger than they were at the time of this study.

In 1975 these data appeared to be rather innocuous in that a minority of those surveyed desired direct payments from hunters, and the supply of free public and private hunting acreage generally seemed to meet the demand. If hunting demand were to increase, however, the implications of the same data would be quite different; i.e., the finding that 25% of rural landowners showed potential interest in compensation for hunting privileges would be of considerable interest.

We believe that the time is approaching when it will be commonplace for landowners to receive compensation for hunting. Cornell Cooperative Extension field staff have reported substantial hunting leases or other compensation arrangements in Cattaraugus County and in counties along eastern Lake Ontario. Our perception of the cause of the expansion of hunting leases is not so much growth in the number of hunters afield, but rather a growing dissatisfaction of the quality of hunting on public lands and private lands where hunters may have their experience disrupted by other hunters. We stress, however, that we have no empirical data on this topic, and suggest that it is an important item for future research. To the extent that the occurrence of hunting leases do increase in the future, this will certainly affect landowners' thinking and eventual policies about free hunting access.

Landowner Attitudes About Hunting

Hunting was once so much a part of rural life that as recently as 25 years ago the question of landowner attitudes about the propriety of hunting would not have surfaced. It was raised empirically for the first time in New York as

part of the 1972 posting survey. Over 75% of both posting and nonposting landowners indicated approval of hunting, about 20% had some reservations about hunting, and 2% disapproved. These are the most recent data available on this topic, but related information helps suggest probable trends.

For example, ownership of rural lands by people who did not grow up in rural areas where hunting was a part of the culture has continued to increase since 1972. In 1980, only about half of the forest owners of New York indicated that they grew up on a farm or in a rural area (Birch 1983:40). In southeastern New York, only 1/3 of the forest owners grew up in a rural area. It is believed that many of these landowners of urban backgrounds do not support hunting or at least do not feel comfortable letting others hunt on their property for reasons discussed above.

As the visibility of the antihunting movement increases and as more people with urban backgrounds become rural landowners, we can expect continued growth statewide in landowner opposition to hunting. A part of this growth can be associated with an increased moral opposition to killing game. A second likely important force is the association of unethical hunter behavior with the activity. Most rural landowners in 1972 seemed to be able to distinguish between their perceptions of hunting as an activity or experience and the behavior of hunters. An increasing population of newer landowners from urban areas may find this distinction difficult because they have little or no experience with the positive aspects of hunting, and because the literature of the antihunting movement depicts unethical behavior as a normal part of hunting.

Other Factors Affecting Landowner Attitudes

Another factor that may affect landowner attitudes toward public access is the amount of wildlife damage they incur. Most landowners who participated in Cornell/DEC studies on farmers' tolerance of deer damage allowed some hunting. We did not determine whether they allowed hunting in the past, and therefore cannot say whether they changed their access policies as a result of experiencing damage.

Landowners' Access Policies

Factors Influencing Access Policies

The array of values, beliefs, and attitudes related to hunting described in the previous section, combined with New York's laws regarding posting and trespass, and with landowner perceptions of the probability of being sued, determine a landowner's willingness to grant hunting access, and whether or not the landowner chooses to post his/her land. As mentioned previously, we feel that it is important to distinguish as sharply as possible between posting behavior and access policies. We will develop the context for this separation of posting from access policies before reviewing rates of posting and percentages of landowners who allow access for hunting.

We deliberately highlight the distinction between posting behavior and access policies because it has been our experience that some DEC staff and FWMA boards historically equated these as one and the same. Perhaps this has been due to the fear that increasing numbers of posted signs correlate with more stringent access policies by landowners or that such would be the perception of hunters (the latter topic is covered in the next section). Additionally, we believe that posting and access should be distinguished because it can be convincingly argued that New York's posting and access laws encourage posting.

On the other hand, these laws do not discourage landowners from allowing hunting.

What groups of landowners logically would not post their lands? We can think of 2 primary groups: (1) those who welcome any and all recreationists to the property at any time, and (2) those who are more restrictive about who they want on their property and when, but who have had sufficiently few problems with recreationists that it has not been worth the cost and effort required to post their property. A third group might include absentee owners and land speculators who just don't think much about the land and its use. In preselected categories used in the 1972-73 posting survey, 47% of nonposting landowners did not post because past users had been cooperative and careful not to damage the property, 46% appreciated the privilege of using other private lands for recreation and therefore felt they should leave their lands open, 20% were aware of State efforts to keep private lands open and were trying to cooperate, 15% indicated there was nothing on the property that anyone could damage, and 15% reported that no one ever used their property (Brown and Thompson 1976:128).

Posting provides the legal backing for several groups of landowners to monitor or control use of their property by others. Landowners who have had problems with recreationists, including those who are bothered that some recreationists use their property without asking permission, may post both to communicate an unwelcome message and to have the ability to prosecute future trespassers. Landowners who want to reserve use for themselves at certain times, and those who generally want to control or monitor who is on their land and when may also feel that it is in their best interests to post their property. Thus, posting can be as much a statement about actively managing or

regulating the use of property as a statement about prohibiting recreational use.

Posting Behavior

We have 3 statewide (north of New York City) studies indicating the percentage of rural landowners who posted their lands: 25% in 1963 (Waldbauer 1966), 42% in 1972-73 (Brown and Thompson 1976), and approximately 50% in 1980 (Brown et al. 1983). Other regional studies, primarily of farmers, provide additional data.

Farmers in the Lake Plain posted at a rate of 38% in 1975 (Brown et al. 1977), approximately the same as the overall posting rate in that region in 1972-73. In the western Central Plain region (Genesee and Wyoming Counties, northern Livingston County, and much of Ontario County), 44% of farmers posted in 1977 (Brown et al. 1978), somewhat less than the 51% of all landowners that posted in Region 8 in 1972-73. In the eastern Central Plain region (primarily Seneca, Cayuga, Onondaga, and Madison Counties), 41% of farmers posted in 1978 (Brown et al. 1979), notably higher than the 31% of all landowners who posted in Region 7 in 1972-73. In a resurvey of these 3 areas in 1981, 43% of all farmers posted (Decker et al. 1982). Posting rates were highest in DMUs 89 (52%) and 86 (53%), located south and southeast, respectively, of Rochester.

In the Hudson Valley, from Albany County on the north to Orange County on the south, 62% of farmers posted in 1980 (Decker et al. 1981). This is higher than the overall Region 4 rate of 49% in 1972-73, but similar to the Region 3 rate of 60% in 1972-73. A 1980 study of landowners within 1 mile of the Upper Delaware River from Hancock to Port Jervis found that about 65% posted in 1980.

Previous studies have shown the highest incidence of posting to be in southeastern New York (although the 1980 study had very little sampling in

Region 3) and in Region 8, particularly south of Rochester. The greatest regional change in posting trends was Region 5, which was 27% posted in 1972-73, but 51% posted in 1980, approximately the statewide average.

The incidence of posting by absentee landowners is somewhat higher than that of resident landowners. However, the incidence of absentee ownership in conjunction with the acreage they own statewide is sufficiently small (although we believe it to be steadily increasing) that the influence of absentee posting on the statewide posting rate is minimal. We would suggest that Region 3 may be an exception in this regard. Any future posting or access study should pay particular attention to Region 3 because it is probably the region of greatest access problems and it was inadequately sampled in 1980.

Our studies suggest that changes in the aggregate rate of posting have occurred fairly slowly, especially in recent years. The 1972-73 study occurred at the peak of snowmobile registrations in New York (they are now down about 50% from that peak level). Significant snowmobile use, in addition to increased hunting demand, resulted in a fairly rapid increase in posting (from 25% in 1963 to 42% 10 years later). While 6% of posting landowners indicated the intention to discontinue posting of about 4,000 acres in 1972-73, landowners who did not post in 1972-73 indicated the intent to post over 7,000 acres the next year. Expanded to the population of all landowners, this would have represented a net increase of 540,000 newly posted acres statewide in the following year (Brown and Thompson 1976:120). We know from the 1980 study that this magnitude of additional posting may have occurred for 1 to 2 years following the 1972-73 study, but could not have continued beyond that.

Posting rates varied slightly between farmers who had deer damage and those who did not. In southeastern New York, about 67% of those

with damage posted, compared to 61% without. However, this difference is almost exactly compensated for by more farmers with damage who posted with "access by permission only" signs. In western New York, 49% with damage posted, compared to 40% with no damage. Use of permission posting signs was the same for both groups.

Access Policies of Landowners

Cornell studies have consistently shown that the majority of rural landowners in New York, including the majority of landowners who post, allow some hunting. In 1980, 65% of posting landowners allowed hunting. This is less than the 79% that allowed hunting in 1972. However, the questions used in the 2 surveys differed, so the results are not directly comparable. Allowing hunting upon request varied regionally in 1980 from only 42% in Region 5 to 78% in Regions 7 and 8 and 73% in Region 9. Statewide, 86% of farmers, and 67% of nonfarm landowners allowed hunting by permission. In each region, higher percentages of farm than nonfarm landowners who posted allowed hunting². In the 3 western New York regions, over 90% of farmers who posted allowed hunting by permission. In contrast, in northern New York Regions 5 and 6, only 61% and 57%, respectively, of farmers, allowed hunting by permission. Absentee landowners whose permanent residence was in metropolitan counties allowed access at about the same rate as those who lived in nonmetropolitan counties. However, regardless of the location of permanent residence, absentee landowners who spent a lot of time on their rural property allowed hunting much less frequently than landowners who spent less time on their properties (Brown et al. 1983).

A more conservative measure of hunting access has been obtained in other studies that have examined whether landowners would allow strangers to hunt.

In the western and central New York survey of farmers in 1982 (our most recent landowner survey with access data), the proportion of farmers who would give permission to strangers who ask to hunt varied from just under 40% in DMUs 76, 82, and 89 to just under 50% in DMUs 93, 97, and 99. This pattern is fairly consistent with the posting pattern; access is greatest in Region 9 DMUs and least (in this study area) in DMUs near Rochester (Decker et al. 1982:76). Comparable 1981 data exist for southeastern New York (although not by DMU) where only 25% of farmers indicated that they typically granted hunting privileges to strangers who ask permission to hunt (an additional 50% allowed friends and neighbors to hunt). Only 19% of landowners who posted allowed strangers to hunt; 35% of those who did not post allowed strangers to hunt (Decker et al. 1981:68).

Farmers who experienced deer damage, although they posted at slightly higher rates, were more likely to allow hunting than those who had no damage. In western New York, 50% of farmers with damage would grant permission to hunt to strangers who ask, compared to 42% of those with no damage. In southeastern New York, comparable figures were 34% and 22%, respectively.

Thus, while the majority of landowners in all sections of the state (with the possible exception of Region 3, where data were insufficient) allowed hunting in 1980, the majority did not allow strangers to hunt. One could infer from these data that hunters who have lived in their county of current residence for a number of years should have little trouble finding a place to hunt in that county. If they live in a rural area, neighboring landowners would very likely allow them to hunt. If they live in an urban area, they should be able to find nearby private lands for hunting (to the degree that such lands exist) through networks of peers who have hunting connections or

through any of various means of getting to know rural landowners. In more distant areas where hunters frequently like to take advantage of opportunities to hunt other species or in a different season, access to private lands is still available, but it takes more effort to obtain it. If a hunter is not already acquainted with landowners, he or she may have to ask several landowners before finding one who will grant permission to hunt. We suggest that many hunters who do not "plan ahead" and find permissive landowners on a previous trip, or who do not allow extra time in a current trip to find permissive landowners, will become frustrated with this process. Such experiences, particularly as access has become more difficult in recent years, may be contributing to an increase in hunting leases.

Hunters' Reactions, Given Landowner Policies

This section will examine our understanding of the influence access problems have had on hunting participation. This includes the extent to which hunters seek access to posted lands and to which posted lands can therefore be considered a potential public hunting resource. It also includes the effects of perceived shortages of both public and private lands on underparticipation in hunting.

Hunters' Assessment of Access Problems

Comprehensive data on the difficulty experienced by hunters in finding access to hunt particular species in given localities of New York, like posting and access data, are no longer current. The one statewide hunter access study was conducted in 1976 (Decker and Brown 1979). More recent studies of particular hunting audiences provide additional insights into the effect of

access problems on participation. Data from these studies, as well as from the 1976 hunter access study, are examined in this section.

The 1976 hunter access study indicated that, as was suggested in the previous section, hunters who did not know their specific destination in advance had more difficulty finding access than those who knew where they were going (including cases where the latter group knew what property they wanted to hunt on but did not know the owner). In 1976, 21% of small game hunting, 16% of big game hunting, and 18% of waterfowl hunting days statewide involved trips for which the location was not determined in advance. On these trips, 69% of hunters encountered access problems. Overall, 52% of hunters indicated some problems with hunting access. However, this includes not only posted lands, but parking, crowding, and road access problems (Decker and Brown 1979:111). The demographic groupings experiencing the most severe problems were the youngest hunters (25 years of age and under) (59%), and those who lived in cities (57%).

Posting, the most frequent access problem, was encountered by 32% of hunters. This varied regionally from 28% in Regions 1, 2, and 4 to 36% in Region 8. The proportions of hunters from metropolitan and rural areas who experienced posting problems were very similar (Decker and Brown 1979:115). The 4 types of game for which access problems were most frequent were ring-necked pheasant, big game, waterfowl, and woodcock. In only one case (Westchester County) in which more than 30 respondents hunted in a particular county for a given species did over 40% report posting as a problem (Decker and Brown 1979:117).

Nevertheless, access problems were sufficiently severe that they affected the number of days of participation by hunters in 1976. Fully 65% of all

active hunters indicated that they would hunt more, given improved access. The latent demand for hunting opportunities, given improved access, was estimated to result in potential increases of 34% in big game hunter days, 59% in small game hunter days, and 91% in waterfowl hunter days in 1976 (Decker and Brown 1979:124).

Because posting is not synonymous with the denial of hunting access, And, as the model for this paper suggests, we are concerned with what hunters do upon encountering posted land. From the 1976 hunter access study, 71% of hunters had sought a different place to hunt in 1976; 55% of these hunters indicated that upon finding posted lands, they would approach the landowner for permission to hunt (Decker and Brown:123).

The data reported above were derived from a cross-sectional study of 1976-77 hunting license holders. That study provided substantial insight about active hunters in 1976; however, it provided no information on the degree to which access problems contribute to discontinuation of hunting. Furthermore, it yielded little insight into how access problems affect the initiation of new hunters. More recent studies have examined these aspects to some degree.

Noncontinuous Hunting and Access

In an effort to estimate the magnitude of noncontinuous hunting in New York and reasons associated with it, a telephone survey was conducted in 1981 of a sample of the general public in Broome and Monroe Counties. The results indicated that if hunting patterns in the rest of the state coincide with those in these 2 counties, over half of all people with hunting experience in the population do not hunt continuously. For every 1,000 continuous hunters who existed in these 2 counties, there were almost 500 additional sporadic hunters

and 650 additional former hunters who had temporarily or permanently dropped out of hunting³ (derived from Brown et al. 1982:14).

From a mail survey of 1977-78 hunting license holders in Broome and Monroe Counties conducted in association with the general population study reported above, about 23% of respondents from both counties listed "not enough places to hunt" as 1 reason why they did not hunt during the previous year or plan to hunt in the coming year. However, among those contacted in the telephone survey subsample who had previously hunted, only 1 individual listed "not enough places to hunt" as a reason for not hunting since the last hunting trip (Brown et al. 1982:32). These former hunters, attributed their failure to renew hunting largely to social or personal reasons rather than to reasons associated with hunting resources. From this, we would hypothesize that restricted access can be discouraging to a significant minority of hunters, and it can be a contributing factor toward discontinuation of hunting, but rarely is it an important factor for not renewing hunting at a future point in time.

Data from deer hunters in northern New York strongly supports this hypothesis. In this study of hunters from the 14 Northern New York counties and 6 adjacent Southern Zone counties who were licensed to hunt big game in 1981, those who did not hunt deer in 1981 were asked why not. About 16% of hunters residing in the Northern Zone indicated that there were not enough places to hunt, and 23% indicated that hunting areas were too crowded. Access-related problems seemed to be less of a problem for respondents residing in the Southern Zone; less than 2% indicated that there were too few hunting areas, while 14% indicated that existing areas were too crowded (Smolka et al. 1983:213).

The initial study of participants in the 1978 HTC suggests also that for those who had taken the HTC 2 years previously, lack of access to private lands was not among the leading reasons for failure to participate in hunting, but it may be a contributing reason for a significant minority of younger potential hunters (Brown et al. 1981). The lack of physical access to hunting resources is a different type of access consideration that has some regional importance. For HTC participants residing in metropolitan New York City-Long Island, the leading reason given for not hunting in 1978-1980 was that travel distances to hunting areas were too great (34%). In addition, 19% indicated that there were not enough places to hunt. In all other regions, the 4 leading reasons for not hunting were of a personal or social nature. Nevertheless, 16% from Regions 3 and 4, 13% from Regions 5, 6, and Oswego County, and 8% from the rest of central and western New York listed "not enough places to hunt" as 1 reason for not buying a license. In upstate regions other than Northern New York, about 11% indicated that travel distances were too great; only 5% of Northern New York residents listed this reason (Brown et al. 1981).

Some further evidence that social and personal reasons have contributed more to inconsistent hunting patterns than access and other resource-related reasons surfaced in the 1983 exploratory study of antecedents to participation.

A total of 21 in-depth personal interviews were conducted with people who had discontinued hunting. After the interviews were completed and analyzed from tape recordings, we concluded that in not 1 of those cases were access problems a primary reason for not resuming hunting (Decker et al. 1984: Appendix F).

Summary and Recommendations

Although the rate of change of both posting and restriction of hunting access to private lands appears to have declined from a peak that occurred in

the late 1960s and early 1970s, we believe that there continues to be an annual net loss in private acreage available for hunting. In some respects, this loss of hunting acreage has not yet become critical. We know from our studies that personal and social considerations are the most important limitations to additional hunting participation. Nevertheless, access shortages almost certainly affect the hunting and license buying behavior of a minority of potential hunters. Thus, the periodic monitoring of access-related issues continues to hold some importance. We suggest that a long-term plan be developed for updates of access-related studies.

A working draft of a DEC Public Access plan (Jones et al. 1986) called for a number of actions with the overall goal of ending increased posting and having 50% of posted private lands available to fish and wildlife recreationists upon request of permission by 1993. The effects of these actions would be measured by Cornell studies (which would also serve as updates on posting). This plan generally seems to be adequate on the landowner or supply side, except that 13 years (from the limited posting study of 1980 to the 1993 evaluation alluded to above) is a long time to wait for a comprehensive update on posting and access.

One important aspect of access that was not elaborated on in the draft plan was the degree to which improved access, coupled with improved habitat, can result in increased hunting participation. It is particularly in this regard that updates of the demand side, from the hunter's perspective, are also needed. The 1976 hunter access study, for example, showed that waterfowl hunter days could be almost doubled if access and habitat were available. Future access strategies need to evolve through systems analysis and planning that concurrently examine supply of game habitat, access, and demand (both in

terms of open acreage and, in some cases, physical access to the resource), by region or ecozone.

For example, studies of recent hunter training participants indicated that numerous respondents from metropolitan New York City did not buy licenses or continue to hunt because of the distance from their residence to huntable areas. Is there as much hunting access as is financially feasible near New York City? If so, is it possible that a different type of access program - getting urban hunters to the resource, may be needed?

New York has had a history longer than that in most states of being concerned about access, measuring access problems, and designing programs to maintain and improve hunting access. To date the majority of effort has been aimed toward securing access from landowners. A number of incentives, including cash, services, additional law enforcement, and reduced liability have been examined to some degree. The initiation of the permission symbols opened what we feel was a new era of access communications. A great deal more could be done in this area to help ensure that those who are interested in hunting know where access is available. Finally, as alluded to above, in some of the largest urban areas, programs may need to be designed to provide a means of getting hunters to the resource. In this regard, hunting access programs and future hunting participation programs now being examined may well need to be linked.

Endnotes

1. The 1980 statewide posting update (Brown et al. 1983) was conducted initially via federal funding to examine landowners' interest and involvement in wildlife-related activities. This study determined whether landowners posted their lands, but it did not investigate landowner perceptions of hunting or hunter behavior.
2. These studies did not ask the species for which landowners allowed hunting.
3. "Continuous" hunters were defined as those who had hunted each of the previous 2 seasons and intended to hunt in the upcoming season. "Sporadic" hunters were defined as those who did not hunt or intend to hunt in at least 1 of the 3 seasons referred to above. Those who did not plan to hunt in either of the next two years were classified as "dropouts". We realized that for some, such a classification would be temporary, while for others, it would be permanent.

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*Chapter Four***TOLERANCE OF WILDLIFE DAMAGE**Introduction

This chapter summarizes the conceptual development and empirical findings obtained from a review of research by the HDRU on the subject of human tolerance of wildlife damage. The purpose is to provide wildlife managers with a better understanding of damage-tolerance research and its part in an integrated approach to damage management.

We begin this chapter with a brief overview of our conceptual model of an integrated approach to wildlife-damage management using a hypothetical example. The overview is followed with a more detailed discussion and illustration of the model's components. The model is used to illustrate how attitudes about wildlife damage are formed, how they can be measured, and how such measurements can be used by wildlife managers. Throughout this chapter, study results are provided to emphasize those portions of the model that have been tested empirically. Those portions that require further research are also identified.

An Overview of the Damage Management Model

Figure 4.1 is a model of 7 important points in an integrated approach to wildlife damage management. The arrows between these points reflect the main links of an ongoing interaction between a wildlife management agency and the publics it serves. Perhaps the model may be best described through an example, one of deer damage attitudes and potential management implications.

In this example an individual, such as a fruit producer, typically has some type of pre-existing favorable/unfavorable beliefs and attitudes about

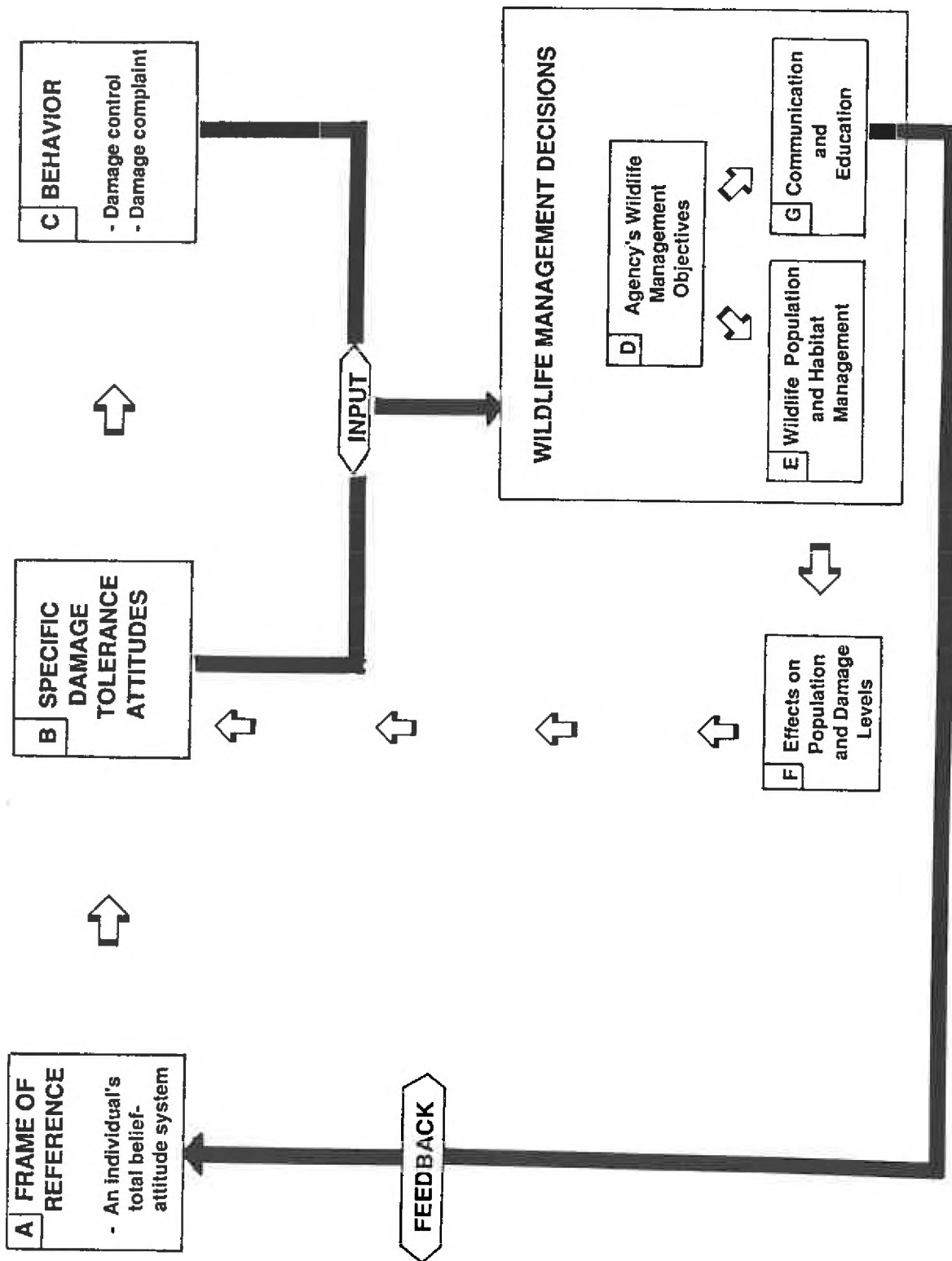


Figure 4.1. Overview of an integrated model of wildlife damage management.

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In this example an individual, such as a fruit producer, typically has the type of pre-existing favorable/unfavorable beliefs and attitudes about

deer (Fig. 4.1-A). If the fruit producer experiences deer damage to his fruit trees, he is likely to form a specific attitude of tolerance or intolerance toward deer in that situation (Fig. 4.1-B). This tolerance level will be strongly influenced by the existing set of relevant beliefs and attitudes, or "frame of reference" (Fig. 4.1-A) that forms the base from which new or modified attitudes may develop. Through exposure to new information or experiences, the grower continually modifies this frame of reference.

Specific attitudes toward deer and deer damage, along with other beliefs and attitudes within the frame of reference, combine to guide the fruit producer's behavior regarding that damage (Fig. 4.1-C). The relationship between attitudes and behavior can become complex, however, because an individual's behavior may often be influenced by a number of external factors and personal attitudes which may vary in strength and importance. For instance, intolerance of deer damage may move the grower to shoot deer under a nuisance permit, yet other attitudes (e.g., negative attitudes about shooting more animals than can be consumed) may prevent him from exhibiting such behavior. Identifying and understanding the nature of such influences is important for effective management programs to prevent excessive deer damage.

Steps D through G (Fig. 4.1) indicate the wildlife management agency's consideration of the attitudes and behaviors of fruit producers and other publics in deer population management. The needs and preferences of these publics (e.g., fruit producers, residential landowners, hunters, etc.) are estimated by monitoring their characteristics, beliefs, attitudes, and behaviors through surveys, license sales, public meetings, damage complaints, or other mechanisms. When considered with biological data, the information allows the responsive agency to adjust its deer-population-management

objectives to reflect contemporary social concerns and constituency preferences (Fig. 4.1-D). Achievement of those objectives is often dependent upon effective public management (i.e., influencing individuals' behavior through regulation, communication, and education).

Through direct mechanisms of public management (e.g., harvest regulations) (Fig. 4.1-E) the agency can relatively quickly effect changes in wildlife population and damage levels. These population changes may also influence individuals' attitudes. In our fruit producer example, an increased harvest of deer may (1) reduce the deer population, (2) reduce deer damage to fruit trees, and (3) improve the grower's tolerance of damage.

Through indirect mechanisms of public management (e.g., communication and education programs, Fig. 4.1-G) the agency can effect less immediate, but equally important attitude changes. Education may focus on correcting inaccurate beliefs and helping fruit producers and other landowners develop the skills necessary to participate effectively in deer damage control and management. Communication programs can inform publics about how their needs and preferences were considered in setting management objectives and the degree to which those management objectives were met.

Communication and education programs, and the effects of management programs, provide the public with a source of feedback, and complete the cycle of agency/public interaction. As public opinion or wildlife populations change, mechanisms of sustained agency/public interaction become vital processes in effective wildlife damage management and in wildlife population management generally.

An Examination of Elements Within the Damage Management Model

The Individual's Frame of Reference

Wildlife-damage-tolerance attitudes arise from an individual's total frame of reference (Fig. 4.2-A) that includes the set of beliefs and values held by an individual. Attitude formation is the mental process by which these beliefs and evaluations of objects, attributes, or events are combined. We may therefore think of attitude statements (e.g., intolerance of deer damage) as reflections of internal mental processes which predispose actual behavior (e.g., damage complaints) (Langenau and Peyton 1982).¹

Attitudes do not necessarily reflect all of the beliefs and values within the frame of reference. Specific attitudes, like intolerance of deer damage, generally reflect the evaluation of a small subset of relevant beliefs and values. Typically, social, cultural, and demographic influences serve as a kind of "screen," determining the relevant information to which an individual responds, and how this information is weighed in forming an attitude. Because individuals often have differing frames of reference, an identical situation may be perceived very differently by each person who observes it. For example, 1 farmer may feel that damage to 5% of a crop is "severe" and "intolerable," while another may find this amount of damage "moderate" and "tolerable."

In New York we have tried to increase understanding of wildlife damage tolerance through research on the beliefs and values underlying this attitude. Generally, that work has indicated that when wildlife populations are managed in a way that does not satisfy important needs across various publics, management problems are likely to result. For example, a study by Decker et al. (1981a) indicated that fruit growers are particularly sensitive to deer damage, and that deer population levels agreeable to other farmers (and

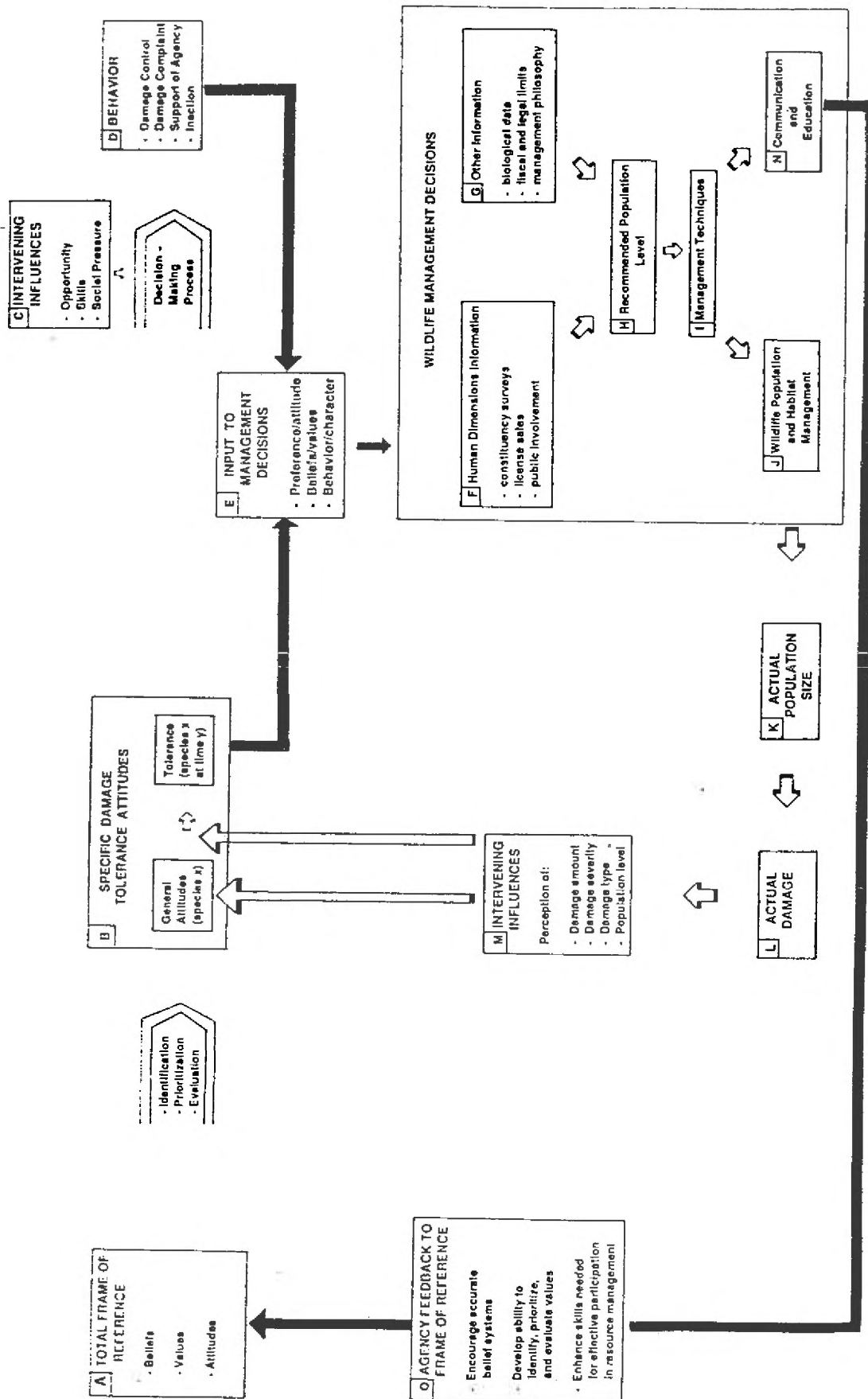


Figure 4.2. A comprehensive model of the development of wildlife damage tolerance attitudes and their importance in wildlife management decisions.

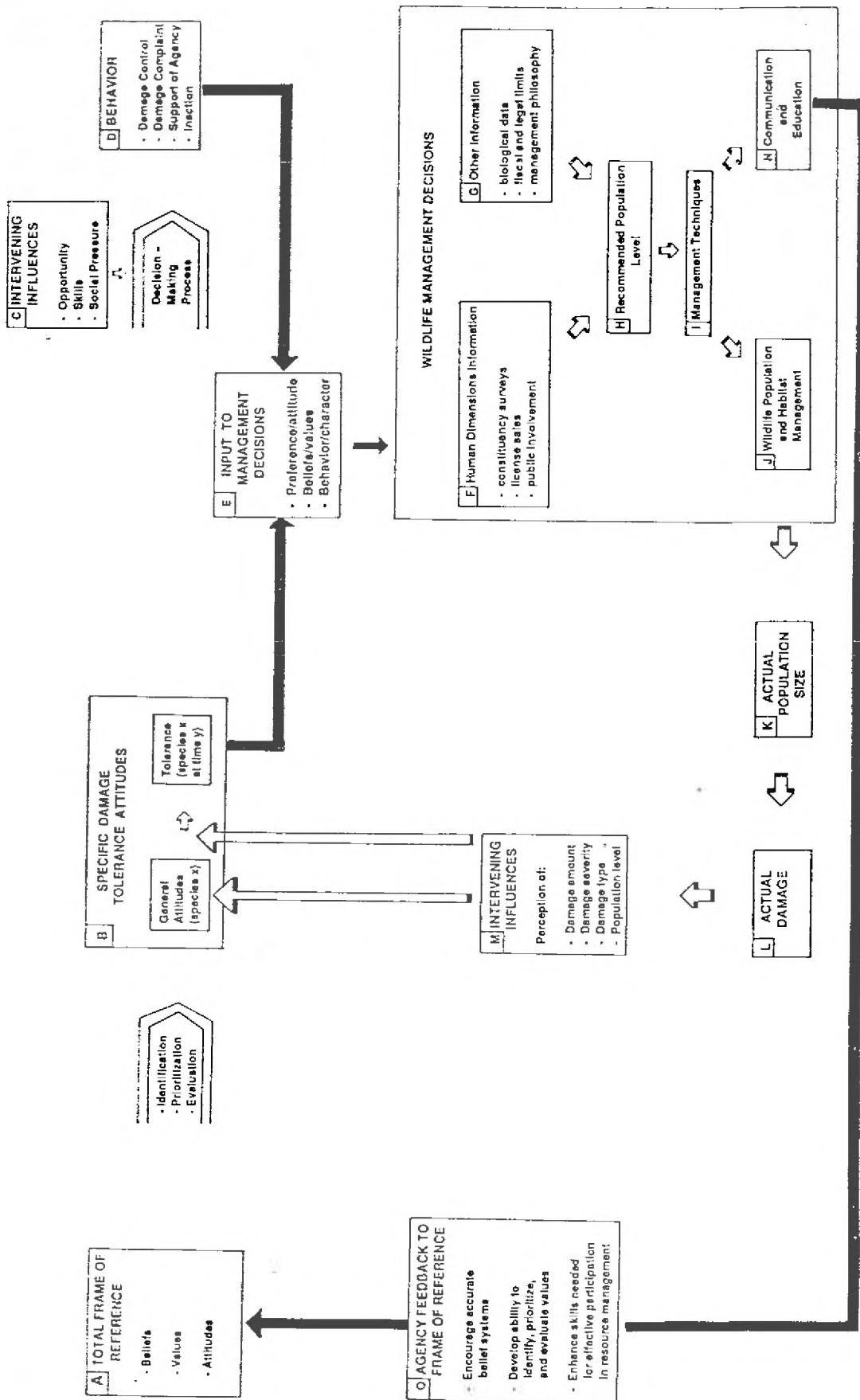


Figure 4.2. A comprehensive model of the development of wildlife damage tolerance attitudes and their importance in wildlife management decisions.

nonfarmers) may be above the level desired by many fruit growers. By incorporating damage tolerance as a factor in setting population levels, the management agency can consider fruit growers' strong economic concerns with the concerns of other publics, and reduce the likelihood of a wildlife management problem. As the number of publics with divergent attitudes increase, wildlife management problems are less easily avoided. Increasingly, managers are faced with the difficult task of setting population levels sensitive to a range of human values which vary within and across publics. Surveys designed to assess attitudes of particular publics offer a cost-effective way to identify relevant beliefs and values and focus agency attention on areas of potential conflict.

Assessment of Wildlife Tolerance Attitudes

In recent years, significant contributions have been made in assessing public attitudes related to human tolerance of wildlife damage. A comprehensive search by Pomerantz et al. (1986) identified 23 studies on the topic with most of the work done in the last 10 years. Leading the way in the development of this information base has been New York State where nearly half of all studies have been conducted. Wildlife damage studies were initiated in New York because wildlife managers in DEC recognized a need for a more systematic approach to incorporating landowner interests into long-range deer management programs. The initial study, conducted in central and western New York in 3 phases (1976, 1978, and 1979), helped define relationships between farmer tolerance, attitudes and perceptions of deer, deer damage, and deer population levels (Brown et al. 1977, 1978a, 1979b). Subsequent efforts were designed to evaluate further various tolerance-related attitudes and influences. These studies included 1 in the mid-Hudson Valley (Decker et al. 1981a) which concentrated on deer damage among full-time farmers, particularly

fruit growers, and a follow-up survey of farmers in central and western New York (Decker et al. 1982) to determine how their perceptions of deer and deer damage changed in relation to an increase in deer numbers. More recently, research on deer damage has focused on deer in suburban areas of Islip, New York (Decker and Gavin 1985a) and Westchester County (in progress).^{*} These studies examined residential landowners' attitudes toward deer damage and other important concerns of health or safety risks associated with deer. Tolerance of other wildlife species has been examined. For example, landowner tolerance of black bears in the Catskill Region of New York, both before and after a managed increase in the black bear population, has been assessed (Brown et al. 1979a, Smolka et al. 1984). Also, tolerance of beaver damage has been examined in central New York (Purdy and Decker 1985). These efforts have enabled us to make generalizations about the factors influencing the development of wildlife-damage-tolerance attitudes and how these factors may affect, or be affected by, wildlife-management decisions.

In summary, our studies have indicated that human tolerance of wildlife damage occurs within a specific context of time and place, and typically with reference to a particular species (Fig. 4.2-B). Attitudes about a certain species influence one's level of tolerance in a particular situation. For example, studies regarding landowner attitudes toward deer damage have shown that most landowners are willing to incur some damage because they enjoy the presence of deer on their property (Brown et al. 1980, Decker and Gavin 1985a, Decker et al. 1982). This appears especially true for persons with beliefs that reflect positive "appreciative" values (e.g., ecological, existence, and

^{*}Both of these studies were supported by the Cornell Agricultural Experiment Station (Hatch Project 147442), not Project W-146-R.

educational) of wildlife (Decker and Gavin 1985a, Purdy and Decker 1985). However, studies have also shown that markedly less tolerant attitudes are often associated with some important constituencies, such as fruit growers; indeed, 1 study showed that only 24% of this group believed the aesthetic values of deer provided ample compensation for damage incurred (Decker and Brown 1982).

Investigations of the influences of tolerance within and between constituencies have demonstrated that additional factors intervene within specific contexts to influence wildlife-damage-tolerance attitudes. Such intervening influences may include perceptions of: the type of damage, amount and severity of the damage, ability to withstand the economic consequences of damage, and social or peer pressure to express certain attitudes relating to wildlife damage (Fig. 4.2-M).

Several relationships between damage tolerance and intervening influences have been suggested; most of these have arisen from studies relating to attitudes about deer damage. Some of the most important relationships are as follows:

- Tolerance decreases as perceived amounts of damage or severity of damage increase (Brown et al. 1980, Decker and Brown 1982, Decker et al. 1984b, Purdy and Decker 1985).²
- Among farmers, those who are fruit growers and others deriving a high percentage of their income from their land use are usually less tolerant of deer damage (Brown et al. 1980, Decker and Brown 1982, Decker et al. 1981b).³
- Thresholds of tolerance of wildlife damage appear to be specific to situation as well as to constituency. That is, although different constituencies may experience similar levels of damage, they often express dissimilar levels of tolerance (at least when measured from an economic perspective) of that damage (Brown et al. 1977, 1978a,b, 1979b; Decker and Gavin 1985a,b; Purdy and Decker 1985).
- Farmers who are hunters are usually more tolerant of deer damage than farmers who do not hunt (Brown et al. 1980).⁴

- Landowners' perceptions of recent trends of wildlife populations, while infrequently accurate, are often positively associated with the amount of damage incurred. Conversely, preferences for future wildlife population levels are often negatively associated with perceptions of recent population trends.⁵
- Tolerance of deer in rural areas is typically influenced by agricultural damage concerns (e.g., Brown et al. 1977, 1978a), whereas tolerance in suburban environments is influenced more often by perceptions of the potential health and/or safety risks associated with deer (Decker and Gavin 1985a).

Damage Tolerance Attitudes and Behavior

Careful measurement and interpretation of attitudes should allow prediction of certain behaviors (Fishbein and Ajzen 1975). For instance, attitude research could be used to confirm the hypothesis that farmers who hold "intolerant" attitudes toward deer damage are likely to act to prevent such damage (Decker and Brown 1982). Little research dealing with wildlife damage, however, has been devoted to corroborating the degree to which attitudes reflect the likelihood of using or not using damage controls. The available information suggests that the relationship may be quite strong. As Purdy and Decker (1985) reported, 60% of a sample of rural landowners reporting beaver damage took some type of action to control the damage. Actual use of beaver damage controls as well as intended continued use of controls was associated most often with persons expressing intolerant attitudes toward beaver.

Although people who are intolerant of wildlife damage may be motivated to prevent or control damage, it is important to recognize that physical or social barriers may prevent them from actually implementing controls (Fig. 4.2-D). Three common barriers are opportunity, skills, and social desirability (Fig. 4.2-C). A brief description of each is provided below, using examples related to deer damage control.

Opportunity:

An individual experiencing damage may use a number of controls, including: hunting, deer repellents, deer exclusion fence, or nuisance control permits. Though personal attitudes may indicate approval of these techniques and faith in their effectiveness, the opportunity for actual control use may be constrained by expense, availability, or legality.

Skills:

Even when available and affordable, a person who approves of chemical repellents, nuisance control permits, or hunting, may not believe he/she has the skills to use these tools effectively. In another case, a person may feel strongly that he/she should actively pursue legislation affecting lower deer populations in agricultural areas. Yet, his/her limited skills in such legislative pursuits could prevent personal involvement.

Social Desirability:

Persons with the skills, opportunity, and inclination to use a given deer damage control still may not exhibit this behavior if social pressure from friends, family, or community is great. Use of a nuisance permit to remove deer, for example, may have negative social consequences for the landowner with damage. In some cases, control use may generate problems of greater consequence to the person than the damage he/she wishes to prevent (e.g., social rejection by family or community). Factors such as these are important for managers to recognize so that their potential effect on the success of a damage control program may be considered.

Use of Human Dimensions Information in Setting Wildlife Population Level Objectives

Thus far our discussion has focused on people's beliefs, attitudes and behavior with regard to wildlife damage. We will now discuss how a wildlife management agency might use this type of information in management decisions. In Figure 4.2 we have attempted to identify the important considerations in wildlife damage management as they relate to the use of human dimensions information. We have not systematically studied the damage management process itself, but illustrate how public input may affect management decisions and how management actions may affect persons' perceptions, attitudes, and behavior with respect to wildlife damage.

Within the management agency a variety of means for obtaining sociological information may be used to help estimate an optimal wildlife population level. For example, the agency may solicit public input through public meetings or constituency surveys. Public perceptions and preferences are also made evident through unsolicited public involvement, including damage complaints, regulation noncompliance, or agency litigation. As Purdy (1987) has noted, however, adjusting management policy on the basis of such unsolicited public input may result in management objectives that unduly deprive many wildlife enthusiasts of potential benefits from the wildlife resource (e.g., hunting and viewing opportunities). Instead, a systematic and scientific process of inquiry is needed to obtain accurate indicators of public perceptions of optimal wildlife population levels.

Sociological indicators that are used to estimate public preferences for wildlife population level may be correlated with existing population estimates (i.e., numbers of animals) to identify an "optimal" wildlife population level. Managers' recommendations for wildlife population levels may be implemented

through management of (wildlife) populations, habitats, or people. As populations, habitats, and human needs and preferences change, population management goals must be adjusted accordingly. Maintaining a species population at a level representative of society's needs and preferences (and within biological constraints) requires a continued exchange of information between the agency and its constituencies (Pomerantz and Decker 1986). Such feedback is a vital component of a cyclical process of wildlife program development (Purdy 1987).⁶

Recent examples of this management process include the use of farmers' and landowners' preferences in decisions concerning deer and black bear population management. In central and western New York, farmers' preferences for deer population levels were compared with DEC indices of deer numbers; approximately 45% of farmers desired deer population increases above existing levels (Brown et al. 1980). Subsequently, controlled deer population increases were allowed in much of those regions. A follow-up survey showed that only 26% of those farmers surveyed earlier desired further deer population increases (Decker et al. 1982). The findings suggested that a "wildlife tolerance capacity" had been reached, as evidenced by rapidly diminished tolerance for increasing populations.

In the Catskill Mountain region of New York, landowners were surveyed prior to and following managed increases of the black bear population to determine their preferences and attitudes about bear. Results showed the percentage of landowners wanting a bear population increase rose from 60% (before the increase in bear) to 71% (after the increase). In this case there was a tendency for landowners who had seen bear, or who were otherwise familiar with bears, to favor an increase in the population (Decker et al. 1985). Based

on survey findings indicating likely social acceptance and the low incidence of bear damage problems, managers proposed yet another increase in the bear population (O'Pezio and Decker [In press]).

Wildlife Population and Habitat Management

Attainment of a desired population level is achieved largely through regulations designed to control the public use of wildlife and their habitats. Hunting, trapping, and habitat manipulation are generally effective in regulating wildlife populations and minimizing negative impacts of wildlife on society (e.g., damage, health, and safety risks).

The use of regulations to affect game harvests are the most direct means of controlling people's actions to achieve desired wildlife population levels. Bag limits, season length, special harvests, weapon restrictions, and access restrictions are currently used in New York to this end. Damage mitigation measures and incentives are other less direct methods by which public management may be achieved. Orchardists, for example, could be given incentives to form a deer hunting cooperative in an area where deer damage has been substantial. Such techniques may effectively minimize individual damage problems without significantly impacting the deer-related recreation opportunities sought by others in that deer management unit (Brown et al. 1977, Caslick and Decker 1978).

Policies or regulations regarding game harvest and habitat use exert direct effects on the actual size of the wildlife population. The amount and severity of damage in a given area is related to the species population level. However, as Figure 5.2 indicates, individual perceptions of wildlife damage and population levels are sometimes incongruent with actual damage and population levels. This distinction is important to wildlife managers since it is not

actual damage, but the individual's perception of damage which shape his/her damage tolerance attitudes.

Past research indicates that in New York, farmers are frequently unable to perceive managed changes in deer populations. Decker et al. (1984a) found only 35% of the farmers surveyed correctly perceived the changes in local deer populations in the preceding 5-year period. The study found that a substantial percentage of farmers (approximately 60%) in areas with increasing deer populations did not experience deer damage but nevertheless became increasingly intolerant of deer. Generally, the studies illustrate that not only is it important to monitor public perceptions, but also that it is often necessary to communicate how those preferences are used in setting population goals and to inform constituencies of the agency's success in affecting wildlife population levels (Decker et al. 1984a, 1984b).

Communication and Education

Less direct, yet equally important management strategies, include attempts to influence the beliefs, attitudes, and skills of constituents through communication and education programs (Fig. 4.2-N,O). These agency programs may be used to inform publics how management objectives were developed, the intention (or goals) of a given action, and the agency's success or failure in achieving that intention.**

Though the limits within which government agencies may attempt to manage public beliefs, values, attitudes, or behavior are a question of considerable importance and debate, they will not be addressed in this chapter. The authors would contend, however, that to the degree that such attempts (1) encourage

**For more information on communication and education, see Chapter 5.

accurate belief systems, (2) develop citizens' abilities to identify, prioritize, and evaluate values, and (3) enhance the skills citizens need to participate effectively in wildlife management, they are valid and useful management strategies.

Summary and Implications

Using damage tolerance information as a factor in setting wildlife population management objectives is a relatively new practice among wildlife management agencies. Most studies and applications of damage tolerance research have occurred in the last 10 years. In New York, DEC began incorporating such factors into deer management planning in the mid 1970s, using data on farmers' attitudes about deer damage (data gathered under Project W-146-R contract with the Human Dimensions Research Unit, Department of Natural Resources, Cornell University). Research techniques developed in these deer damage tolerance studies have since been used to assess other damage tolerance situations in New York, including those pertaining to black bear, beaver, and deer damage in suburban areas.

The work done in New York and elsewhere provides a data base from which human thresholds of wildlife damage tolerance have been explored. The data yield insights on several factors that influence tolerance to wildlife damage including: landowners' perceptions of damage amounts and severity, attitudes toward existing wildlife population levels, and preferences for future population levels.

Damage tolerance appears to differ with: (1) the values of the individual affected (e.g., those with high ecological, educational, and appreciative values of wildlife are usually more tolerant of damage), (2) the perceived amount of damage (e.g., as damage increases, tolerance decreases), (3) and the

perceived impact on income (e.g., as income derived from the land use increases, tolerance decreases). The data indicate that wildlife damage tolerance levels are likely to differ between constituencies, and are also likely to change over time for the same constituency.

Perceptions of wildlife population levels are strongly associated with damage level (e.g., individuals experiencing damage are more likely than others to perceive an increase in the wildlife population). However, several studies indicate that most landowners hold inaccurate perceptions of wildlife population levels.

Preferences for future population levels have been negatively associated with both perceptions of the current population and the estimated dollar value of damage incurred. Yet, across studies of human tolerance of deer damage, the majority of landowners either favored keeping population levels stable or having them increase.

Perhaps the most important implication derived from the damage tolerance research conducted to date is that in the absence of damage tolerance information, a significant discrepancy may exist between an agency's wildlife-population-management objectives and the population preferences of a given constituency group (like orchardists). This represents a potential management problem. Current information on the perceptions and preferences of key constituency groups (e.g., those most affected by wildlife population management objectives) are thus an essential component in setting "optimal" population levels. Without this information managers may establish wildlife population levels which exceed the damage tolerance threshold of a key constituency, or if established too low, could unduly limit the benefits people could be receiving from the wildlife resource.

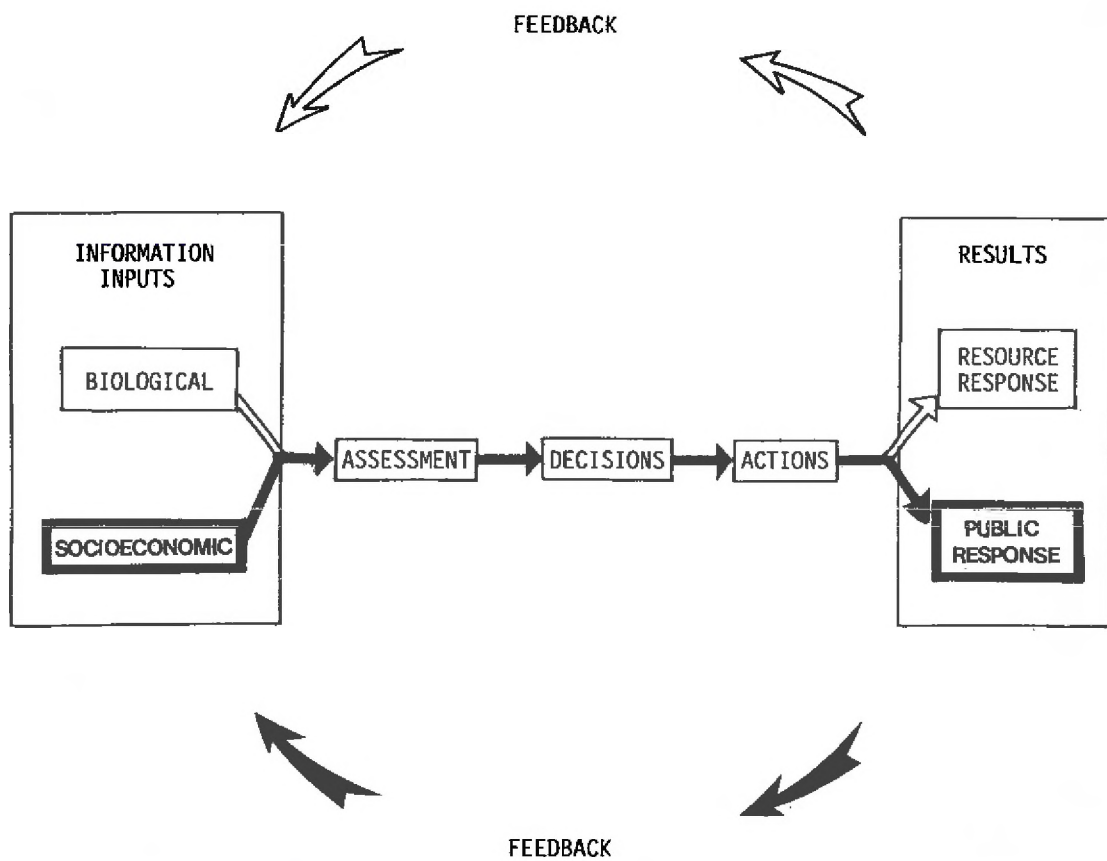
In this chapter we have tried to illustrate how damage tolerance information can be used in wildlife population management. We have developed a model showing how damage tolerance information may be incorporated as a factor in a comprehensive management process--one designed to consider both biological and sociological inputs in setting wildlife population level objectives. The strengths of such an approach are that: (1) it allows managers to monitor and respond appropriately to public needs and preferences; (2) it helps managers identify areas of potential conflict; (3) it maximizes the wildlife benefits available to key publics; and thus, (4) it can increase public acceptance of agency programs. The approach also holds a challenge for agencies: it requires mechanisms of sustained input (e.g., surveys and public hearings) and agency feedback (communication and education programs). The authors suggest that for several species (e.g., deer, beaver, bear, and waterfowl) the management approach presented herein offers an effective way to minimize wildlife damage control issues and generally increase public acceptance of a species management program. In these cases, the advantages of a comprehensive management approach merit consideration of an increased agency commitment to sustained public input and agency feedback mechanisms.

Endnotes

1. In his study of knowledge, affection, and attitudes toward animals in American society, Kellert states that attitudes are rarely entirely consistent with an individual's behavior, but in nearly all cases some evidence of attitude-behavior consistency is expressed (Kellert 1980). Recent social-psychology literature supports the contention that general behavioral predictions can be generated from attitude research when results are interpreted in light of several constraining variables.

If an attitude measure is tailored to the degree of specificity which the researcher wishes to probe, then the measure can be a fairly accurate predictor of behavior (Fishbein and Ajzen 1974). In other words, general attitudes are predictive of general behaviors, while specific attitudes are better predictors of specific behaviors (Fishbein and Ajzen 1974, 1975; Weigel et al. 1976).
2. In the earlier deer damage studies, approximately three-fourths of those landowners who thought deer damage was "unreasonable" wanted the population to decrease (Brown et al. 1977, 1978a). In the deer damage study conducted in southeastern New York, perceptions of damage severity and percentages of total crop value lost to deer were most highly correlated with future deer population trend desired (-0.761 and -0.617, respectively) (Decker et al. 1981a). In central and western New York, most farmers without damage wanted an increase in the deer population while most farmers with damage wanted the population to remain the same (Brown et al. 1980).
3. In studies of New York farmers, the mean dollars of deer damage was highest for fruit growers (Brown et al. 1977, Decker et al. 1981a). Damage was most widespread among fruit and grape growers. In a 1982 resurvey, small fruit growers had the highest mean dollars of damage (Decker et al. 1982). In central/western New York, 1.51 to 2.00 buck take/square mile (BT/SM), a measure of population level, was found to be optimum for full-time farmers. They also showed considerable tolerance of deer damage up to the 2.50 BT/SM level. Fruit growers were generally less tolerant; BT/SM over 1.00 resulted in 75% to 100% of the growers wanting a decrease in the deer population (Decker et al. 1981a).
4. In the 3 western New York surveys (1977, 1978, 1979), a majority of farmers (54% to 59%) who had hunted deer during the hunting season preceding their being surveyed wanted an increase in the deer population, whereas a majority of nonhunters (54% to 60%) wanted the population to remain the same (Brown et al. 1980).
5. Several studies suggest that preferences for future population levels were related to the perceived dollar value of damage incurred (Decker and Brown 1982, Decker and Gavin 1985a). Additional work done in this area has included using all previous deer damage studies to identify deer damage severity zones. These are areas where farmers' perceptions of deer damage were high (based on the percent with damage and the mean dollars of damage). In these zones, managers may want to focus efforts on providing appropriate mitigation measures (Connelly and Decker 1985).

6. The cyclic process of incorporating socioeconomic values into wildlife management programs.



Source: Purdy (1987).

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Chapter Five

COMMUNICATION AND EDUCATION

Introduction

Communication and education programs are fundamental mechanisms of wildlife management. Such programs, in a variety of forms, are conducted by state and federal wildlife management agencies, state cooperative extension services, and private wildlife conservation organizations. C&E is a responsibility to various degrees of all agency staff as they interact with the public and personnel of other agencies. C&E programs perform an important albeit difficult role in bringing public involvement to decision making and in influencing public perception of and behavior toward wildlife resources and their management. The traditional focus of C&E efforts has been to raise informational levels of the public (Hendee 1972, Witter and Sheriff 1983). The basic assumption of many C&E programs has been that an informed individual will make the "right" (i.e., agency desired) decisions and behave accordingly. Indeed, considerable evidence indicates that people do tend to behave in a manner consistent with what they know (Heberlein and Black 1981).

In this chapter we present and describe the elements of a wildlife management communication planning model that can be used to aid communications and educational program development associated with particular species management programs. We also present data from a variety of studies that have had communications and education emphases. The importance of such information is demonstrated, where sufficient data permit.

Despite the importance of C&E to agency effectiveness in management, little evaluation of C&E efforts has been conducted in New York. We have

included this chapter on C&E primarily to share our thinking to date on the role of C&E in contemporary wildlife management. However, with the exception of the topic of agency image, little empirical evidence exists to verify the specific relationships and overall process we will be presenting.

Consequently, the model presented in this chapter represents our ideas of how C&E can be used in the future and is a significant departure from traditional C&E approaches.* We encourage the agency to think about its C&E efforts to date and consider the usefulness of the approach suggested by our depiction of a Wildlife Management C&E Planning Model.

Our observation is that the traditional approach taken by wildlife agencies to C&E has not been adequate to affect public perceptions of management issues and agency effectiveness such that the public responds positively to management programs. One reason for the lack of positive public response is that the management agency has not systematically incorporated the public's perceptions into a communications strategy.

In New York a traditional C&E goal has been to increase *public awareness* of a management problem through agency publications and public presentations. An example, however, of where achieving such a goal would probably not have influenced a management problem was in Northern New York (NNY). The DEC believed that the general public in NNY found the pervasive illegal deer kill in the region socially acceptable. They felt a program to increase public perceptions of the problem would help address the situation. A survey of NNY residents, however, revealed that the public was aware of the illegal deer kill and found it unacceptable. They were tolerant of accidental illegal kill or

*A preliminary version of the model was used as a conceptual and analytical tool in a study of organization leaders' attitudes toward deer management in Northern New York (Smolka and Decker 1985).

illegal kill for personal food, but thought that those convicted should be punished more severely. The important finding was that though residents believed it was wrong to take deer illegally and knew it occurred, they did little to abate it. A traditional C&E program designed to increase public awareness of the problem would probably have done little more than reinforce something already known. Rather, it was suggested that a strong extension program to encourage overt action to reduce illegal kill was necessary to improve the situation. Residents needed motivation to take actions against illegal deer kill, such as reporting offenders and influencing justices to impose stiffer penalties (Decker et al. 1981).

The above example illustrates how C&E effectiveness can be improved by identifying and addressing a wider range of factors that influence constituents' attitudes toward management. The agency's C&E program, if responsive to public perceptions, can help reduce conflict and increase public satisfaction and support, thereby facilitating the achievement of more effective resource management (see Appendix 5.1, Decker et al. 1985).

The model presented in Figure 5.1 illustrates the relationship of a C&E program to the agency's resource management program and how they complement each other to achieve the agency's goals and objectives. A well-designed C&E strategy is developed and implemented to affect the public's perceptions of the agency so that the public responds favorably to agency programs. An evaluation of C&E programs examines the impacts of C&E on public perceptions and response to management programs. The agency uses information on C&E evaluation and the public's response to modify future C&E and management programs to improve its performance in meeting management goals.

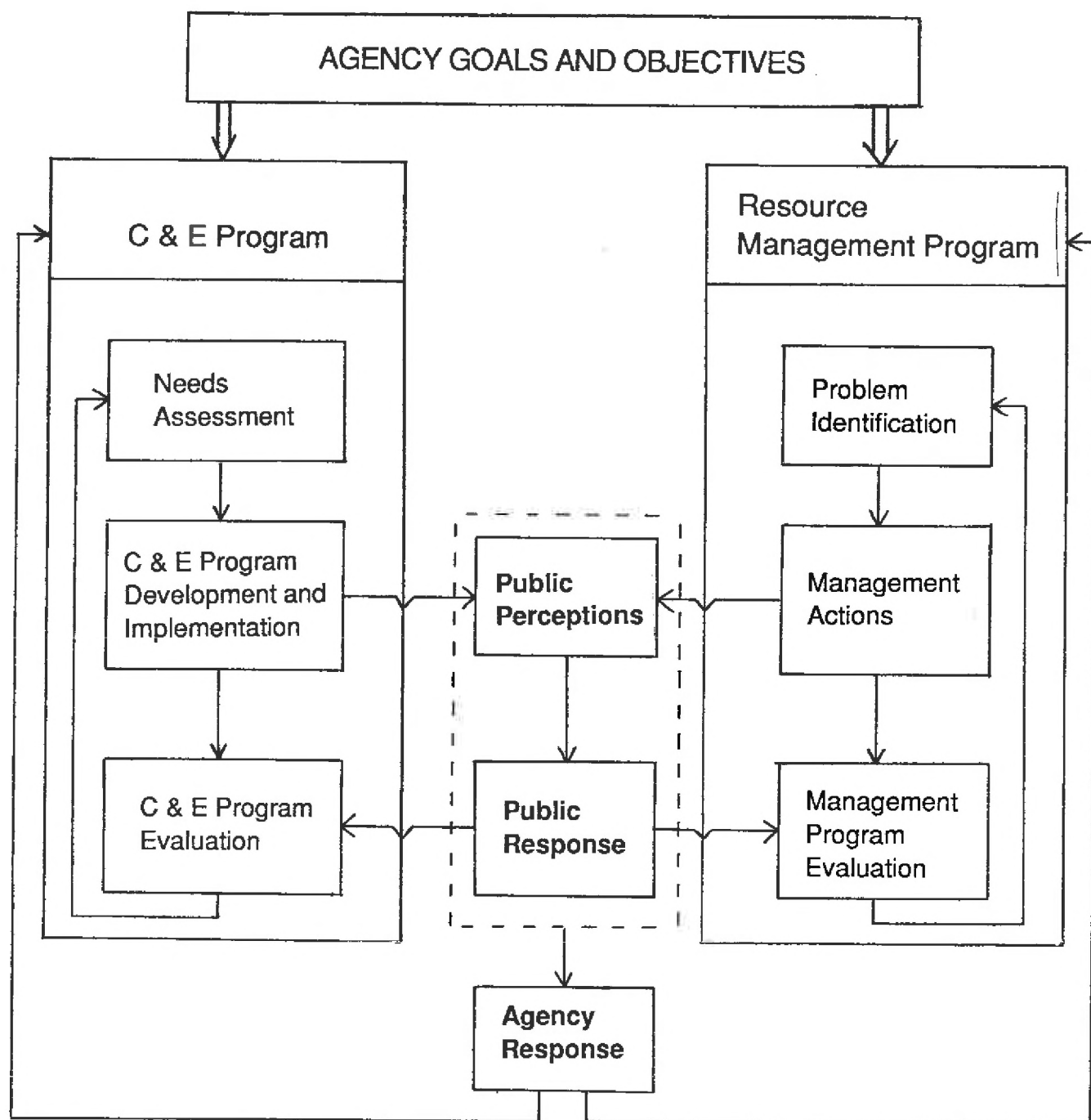


Figure 5.1. The relationship of C&E to wildlife management goals and objectives.

One element in Figure 5.1, "C&E Program Evaluation," has had little attention. As mentioned earlier, no comprehensive evaluation of a C&E effort relative to a particular wildlife management program has been undertaken in New York. Without systematic evaluation, the effectiveness of C&E strategies, including cost effectiveness, cannot be assessed. Nor is it possible to identify where substantive improvements should be made in particular aspects of a C&E strategy. We view C&E evaluations as critical to the establishment of an effective C&E program.

A Wildlife Management Communication Planning Model

We have developed a wildlife communication planning model (Fig. 5.2) that reflects and expands three primary elements of Figure 5.1--public perceptions, public response, and agency response. The public's perceptions of a wildlife management situation are reflected by their support or opposition for management programs. The agency needs to understand the public's response to management and the attitudes toward management issues which underlie public support or opposition to be able to formulate an effective communications and education strategy (agency response) that can address the public's concerns.

Agency response to a particular situation of public support or opposition can be of two general types: education or communications. These responses should be planned to complement the agency's resource management program response and coordinated into a comprehensive management strategy. The educational component should be geared to influence people's wildlife-related knowledge, experiences, beliefs, and attitudes. The communications effort should be designed to influence people's perceptions of the agency and its program. The ultimate impact of a coordinated C&E strategy would be to influence people's beliefs and image of the agency favorably, resulting in

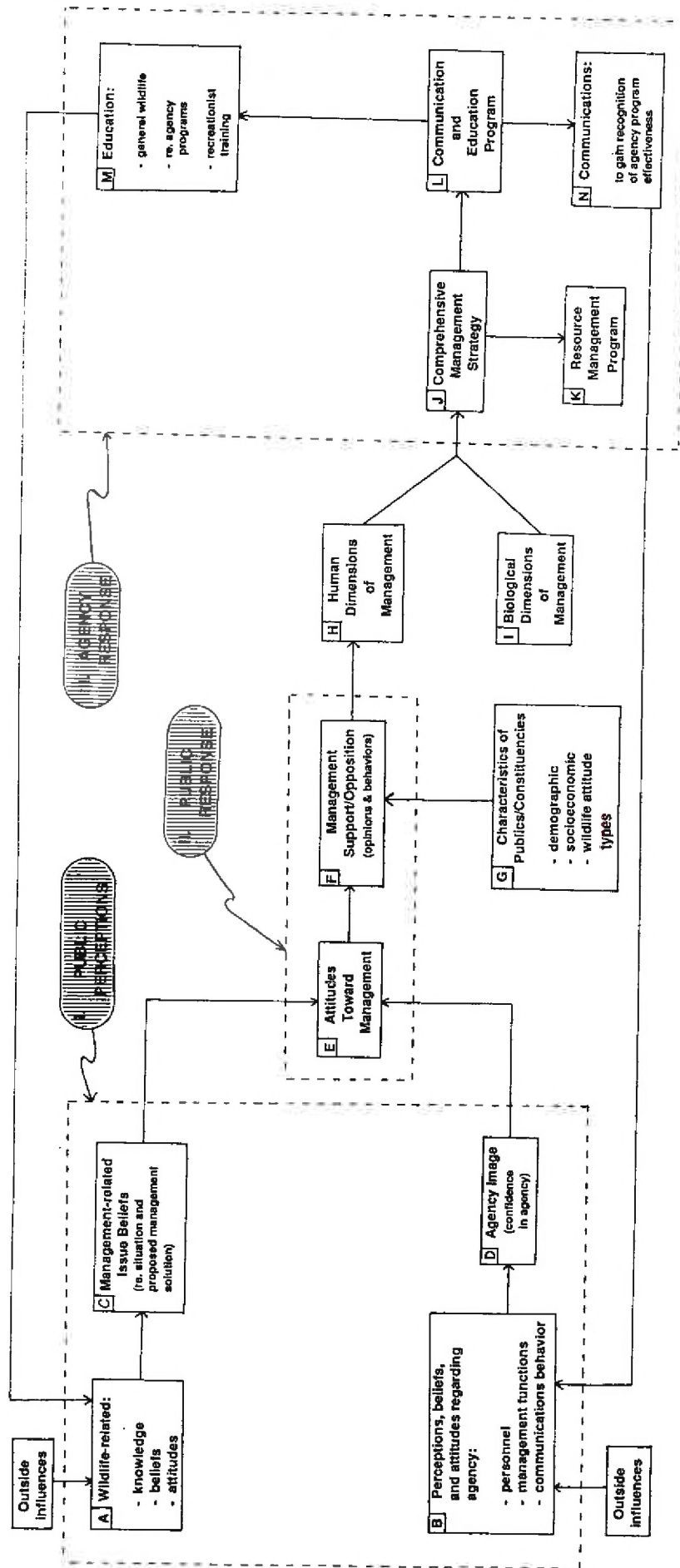


Figure 5.2. Wildlife management communication and education planning model.

improved attitudes toward management, expressed as support for management programs.

The studies of farmers' tolerance of deer damage conducted in New York between 1976 and 1982 show how knowledge of constituents' beliefs of a management issue and image of the agency could have been used to improve the effectiveness of C&E efforts to influence the public's attitudes toward management and support for management programs. It was found that New York farmers who had experience with deer damage to their crops more often had misperceptions about deer population levels than farmers without deer damage (Decker et al. 1984). This information could help DEC gain support for deer management programs if the agency's C&E efforts addressed this specific audience of farmers, informing them of the effect of management programs to reduce deer populations in areas of extensive deer damage. Effective communication of information to public segments before and during the period of their attitude formation about an issue can be an important factor in the outcome of such issues.

The process model of Figure 5.2 is cyclic. Antecedents to the formation of attitudes about management are both inputs for C&E planning and, after C&E intervention, "results" of the C&E program. More detailed descriptions of the elements of the model are described below.

Public Perceptions

Management-related issue beliefs (hereafter referred to as beliefs) regarding a wildlife management problem and proposed management solution(s) are the cumulative product of an individual's knowledge, beliefs, and attitudes pertinent to the situation. These are molded in part by personal experience, through various communications, and education. The agency can provide personal

experiences through its wildlife population management programs and regulation of human use; communicate with the public through informational campaigns using a variety of print and electronic media; and educate its constituents through specific programs aimed at adult and youth audiences. There are also a multitude of other experiences and educational opportunities available from sources other than the agency. The importance, or potential impact of these outside influences on the formation of an individual's beliefs depends on the credibility of the source, the presence or absence of agency-originated interventions to influence beliefs (i.e., to put other information in perspective), and the credibility of the agency. This latter point leads to the importance of the agency's image.

Agency image, or the credibility of the agency in the minds of members of a constituency, is inexorably linked to the confidence people have in the agency's ability to develop and implement a management program. Project W-146-R research has identified three fundamental elements that combine to produce an individual's image of an agency. They include people's perceptions, beliefs and attitudes about (1) agency personnel, (2) management functions, and (3) communications behavior. An individual's perceptions of these attributes of the agency may be based on first-hand, personal experience or on second-hand, vicarious sources of information.

An exploratory study was conducted for the Bureau of Wildlife, NYSDEC, to improve the Bureau's understanding of these factors relative to the deer management programs in Northern New York (Decker 1976a,b). A scale of opinion statements was developed to measure public perceptions of these traits (Brown and Decker 1976). A modified scale has been used in 3 recent studies serving program planning and policy development in specific management areas. The

findings from these studies provide insights into the relative importance of public perceptions of these traits of an agency's image vis-à-vis support for programs.

For example, in 1983 a study of deer hunters in Northern New York was conducted to determine their opinions about deer management in the region (Decker et al. 1983). Using the image scale, it was found that half of the deer hunters had no opinion of the qualifications of DEC's deer management personnel. A relatively even division occurred among those having positive, negative or no opinions of DEC's deer management program. However, nearly half of these hunters felt that DEC was not communicating well with them and was not listening to their views. This documents the extent of hunters' perception of insufficient two-way communication between them and DEC, a situation needing improvement if the agency hopes to improve its image with this important public.

Two studies have been conducted with leaders of a variety of organizations having interest in deer in Northern New York to assess DEC's image regarding its deer management program (Brown and Decker 1976, Smolka et al. 1985). Although the studies were separated by 9 years, the results were very similar. Organization leaders' opinions of DEC's (1) management program and (2) personnel were generally positive, while opinions of (3) communication behavior were most often negative. The last image trait, communication behavior, again seemed to be in the greatest need of improvement. Thus, our research has found that the behavior of an agency in communicating its rationale for management programs and showing consideration of the opinions of its constituents in formulating its management plans may be the most important determinant of an agency's image (Decker 1985).

Knowing that people distinguish between traits of an agency's image and determining which traits are in greatest need of improvement should be useful in targeting efforts to improve that image. Data from 3 studies in New York indicate that a positive relationship exists between an agency's image and support for its programs (Decker 1985, see Appendix 5.2, Table 5.1). In every study, people with a positive overall image of DEC were more likely to support than to oppose the agency's management efforts unconditionally. People with a generally negative image either showed no tendency toward extreme support or extreme opposition positions, or were more likely to oppose than support the agency's management efforts, depending on the audience studied. These trends usually held for each of the 3 particular image traits as well (Decker 1985). The relationship of agency image and support for management programs, however, needs further examination.

Public Response

Attitudes toward management in a particular situation reflect an individual's beliefs, mediated by the image of the agency held by the individual. For example, people who understand the need for a proposed management solution may have a negative attitude toward the proposal if they harbor a negative image of the agency. Conversely, some people who do not understand the need or basis for a management solution proposed by an agency, but who possess the utmost confidence in the agency (i.e., hold a highly positive image of the agency), might develop a moderately positive attitude about the proposal. The study of wildlife organization leaders' opinions of wildlife management situations in Northern New York (Smolka and Decker 1985) provides evidence that people's support of management efforts are mediated by

their image of the agency, regardless of their knowledge of the particular management situation.¹

Management support or opposition regarding a particular issue is manifested in expressions of opinion and more directly in actions. These behaviors may be observed in the form of conversations, letters, the media, ballots on referendums, political activity, and compliance/noncompliance with regulations to affect management, etcetera.

Basic characteristics of key constituencies, particularly those with known positions of support or opposition for a management program, should be identified and used by the agency to develop an effective C&E strategy. Information on selected demographic and socioeconomic characteristics and basic wildlife attitudes and values of target audiences is essential for developing messages and selecting delivery methods for effective C&E programs. Fazio and Gilbert (1981) suggest that publics should be defined based on similarity in attitudes and values about wildlife management. This approach to identifying publics would then determine how an agency's messages might be structured.

Our research in this area indicates that such an approach has merit. Upon scrutiny of a variety of organizations' (New York affiliates) attitudes and values toward wildlife and its management, we have made some surprising discoveries. For example, Ducks Unlimited and Defenders of Wildlife were similar in their values regarding raptors, more so than either group was to The Nature Conservancy, Sierra Club, or Fund for Animals (Brown and Decker 1982). A general process for applying wildlife-related organizations' attitudes and values information to agency decision making was described by Brown and Decker (1982, see Appendix 5.3) and could be used in a variety of wildlife management situations.

Other unanticipated attitudes and values similarities of communication importance have been uncovered. Over the course of 5 years we have developed a Wildlife Attitudes and Values Scale (WAVS) to measure an individual's attitudes and values toward wildlife. It has been used in 14 studies and has consistently illustrated the existence of 3 dimensions to people's attitudes about wildlife: those relating to noneconomic/nonextractive use beliefs, those relating to economic/extractive use beliefs, and those relating to problem tolerance beliefs (adapted from Purdy et al. 1984).

To illustrate the use of this wildlife attitudes and values information relative to profiling publics for communications planning, we developed a typology of all possible positions Catskill landowners could have regarding the 3 dimensions described above (Decker 1985, see Appendix 5.2, Table 5.2). For those in a given type, the percent of positive responses always exceeded negative responses for the management and personnel traits, but the opposite was always true for communication behavior. Most important, while the 3 types most highly valuing black bears overwhelmingly reported favorable impressions of DEC's management and personnel characteristics, by a 2-to-1 margin they consistently reported unfavorable impressions of DEC's communication behavior. The importance of these findings is twofold: (a) communication behavior of DEC relative to bear management was deficient from the standpoint of landowners, regardless of their value orientation regarding bears, and (b) the Catskill Region landowners were diverse in the ways they value bears and in their attitudes about bears; therefore efforts to communicate with these landowners need to consider this diversity. This essentially means treating landowners with different attitude/value orientations as different publics for communication purposes. For example, we know that over 90% of landowners

highly regard noneconomic/nonextractive and economic/extractive values of bears, that 58% highly regard both noneconomic/nonextractive and problem tolerance values of bears, and that 41% highly regard all 3 dimensions of the values of bears. Reviewing the particular value items comprising each of these dimensions may substantially aid DEC in preparing communications about bear management in the Catskills. Once an agency has insights such as those discussed above about their publics and agency image, it is in a position to take action for image improvement (Decker 1985).

Agency Response

Agency response to the public (or key constituencies thereof) typically takes two forms: (1) resource management programs and (2) C&E programs.

Resource management programs are those manipulations of people (e.g., regulations) and natural resources (e.g., habitat management) that are used to meet management objectives. A C&E strategy complements management programs with two different but coordinated thrusts: educational programs and communications activities.

Educational programs can have several emphases: general wildlife education to improve people's awareness, understanding and interest in wildlife management; specialized education about the basis, need, and elements of a particular wildlife management program; and wildlife recreationist training to ensure safe and ethical conduct afield or afloat thereby enhancing human benefits from wildlife management. These types of educational programs directly influence people's wildlife-related knowledge, beliefs and attitudes and ultimately influence their beliefs about management situations and programs.

Communications activities represent the second thrust, designed to gain recognition for the effectiveness of the agency's programs. The impacts of wildlife programs may be measured in terms of health of the wildlife population (e.g., reproductive rates, physical condition) and human benefits (e.g., recreation days; game harvested; satisfactions derived; economic impact on a community, region or industry sector). If structured carefully, these communications activities should influence the way people perceive agency personnel, management functions, and the agency's communications behavior; in essence, they should serve to develop or maintain a positive image of the agency.

Uses of C&E in Management

Research conducted in 1978 and 1983 on landowners' attitudes toward black bears and their management is one example of how public input has been used to guide wildlife management and how public perceptions and response to agency programs can be used to develop an effective C&E strategy (Decker et al. 1985, see Appendix 5.4). Based on black bear (*Ursus americanus*) population studies prompted by declining hunter take of bears in New York's Catskill Mountains, DEC determined that the range was below biological carrying capacity and initiated efforts to expand the population incrementally (Fig. 5.2-I). DEC closed the bear hunting season for two years (falls of 1976 and 1977), resulting in a subsequent 80% increase in the bear population by summer of 1978. Recognizing the potential for even greater increases in the bear population, the DEC wanted baseline data on landowners' attitudes toward bears prior to late spring 1978 when landowners' would have first perceived the higher bear population. Consequently, a survey was conducted in early spring 1978 to determine landowners' attitudes toward bears and opposition or support

for the management program to increase the bear population (Fig. 5.1-F). The survey showed that landowners would be tolerant of the increase in the bear population (Fig. 5.2-C).

In 1983 a second survey was conducted to determine if landowner attitudes changed as a result of the population increase and to identify the reasons behind any opposition to a proposed further increase in the population (Fig. 5.2-I & II). Information was gathered on the public's perceptions of the changes in the bear population and their response to the bear management program. The majority (71%) of landowners responded positively to the management program, favoring an increase in the bear population. Their support for the management effort, however, was not based on knowledge of the bear population size. Most landowners did not know that the population size had changed between 1970 and 1978. Their positive attitudes toward the bear management effort (Fig. 5.2-E) were related more to their experiences (Fig. 5.2, outside influences) with bears. Those who had come into contact with bears were more familiar with their behavior and desired a population increase. Attitudes toward management did not seem to be affected by the public's image of the agency (Fig. 5.2-D), as most expressed no opinion about the agency's personnel, management functions, or communications behavior (Fig. 5.2-B).

Those who did not favor a population increase were less familiar with bears and bear management, had fewer experiences with bears, were less desirous of seeing bears on their property, and were more likely to believe that a population increase would escalate the negative aspects of human/bear interactions (e.g., vehicle-bear highway accidents, property damage) (Fig. 5.2-A).

Characteristics about the groups who supported and opposed the bear management program were identified (Fig. 5.2-G). For example, more of those in favor of the program were hunters and a greater percentage of those in opposition were resident versus absentee landowners.

Based only on public input, there was no apparent reason why DEC should not increase the Catskill bear population. A majority of landowners wanted an increase, and those who opposed one were unfamiliar with the Catskill bear population. Furthermore, it was likely that most landowners would not notice a 50% increase in the bear population.

It was recommended, however, that while the population is increasing DEC should implement a C&E program to improve landowners' understanding of bears and the bear management program. The combination of the population management actions and C&E efforts would comprise a comprehensive management strategy (Fig. 5.2-J) that should in turn affect the public's beliefs and their image of the agency (Fig. 5.2-C & D).

The study of public attitudes toward black bears and their management in the northern Catskills indicates how public input that is collected systematically can be used to guide wildlife management. In this case, the limits of people's tolerance of bears may be reached before biological carrying capacity is attained. Often reluctance on the part of segments of the public to endorse population management is the result of a combination of misperceptions about actual management situations, beliefs, and attitudes based on inaccurate or no information and inadequate two-way communications between the agency and the public. Managers can use public input to identify these misperceptions and information voids and to point to specific channels through which education programs can be directed.

Since the 1983 survey, new objectives for bear management have been identified (O'Pezio and Decker [In press]). The DEC wants to manage the northern and southern bear populations with different hunter regulations to maximize recreation benefits and increase population levels. Managers believe that to accomplish management goals the public must be educated about the rationale for proposed management actions. Two means have been identified for communicating information to the public: (1) a public informational forum about bears and bear management in the Catskill region, and (2) the printing of bear management information on the back of big game licenses. The 1978 and 1983 surveys of Catskill landowners suggest that these efforts will be a positive step in gaining public support. They may not be sufficient, however, in communicating the information to those people who need it most--the nonhunting public. The people who will receive the information presented through the bear forum and license brochure are primarily hunters. Research has indicated that this group already has positive attitudes toward the bear management program. The group who does not favor a population increase, however, probably will not be reached by these mechanisms.

If the agency wants to reach those who could potentially oppose their management actions, there needs to be a C&E effort designed specifically for this audience. It requires the agency to expand beyond recreationist-oriented information to specialized education regarding agency programs and general wildlife education (Fig. 5.2-M). Catskill landowners indicated that state and national magazines were their preferred information source. *The Conservationist* can be used as one means of distributing this type of information to those who are most in need of it. Other media may be used as well. The combination of C&E activities, if they are targeted to specific

publics, should reach the variety of agency constituents that exists regarding bear management.

Conclusion

Although Project W-146-R has not conducted a comprehensive examination of C&E efforts in support of a particular wildlife management program, we have gained considerable insight into the importance of C&E to successful management. We have also developed some ideas about how C&E can influence public support of agency programs. Our current thinking on this overall process and the relationships between elements in the process are depicted in Figure 5.2. Further research in C&E would be valuable and the conceptual model could help guide inquiry in this area.

In summary, we would like to reemphasize some key points:

- the traditional approach to C&E where creating awareness was the goal has limited success in increasing acceptance of agency programs,
- in a comprehensive management strategy a C&E program should be designed to complement the resource management program to achieve the agency's goals and objectives, and
- C&E program evaluation is necessary to determine if C&E programs are favorably affecting the public's perceptions and support for agency programs.

Endnotes

1. Table 5.1. Organization leaders' support/opposition of management programs relative to their image of agency traits and degree of public recognition of a wildlife management problem.

		<u>Percentage of responses in support/opposition to management programs</u>			
		<u>Full support</u>	<u>Conditional Support</u>	<u>Qualified Opposition</u>	<u>Full Opposition</u>
<u>Management Problem in</u>	<u>Agricultural Range*</u>				<u>Total %</u>
Positive Communications Image Recognized Problem Did Not Recognize Problem					
		40	33	17	10
Negative Communications Image Recognized Problem Did Not Recognize Problem					
		35	25	31	9
Positive Personnel Image Recognized Problem Did Not Recognize Problem					
		18	30	25	27
Negative Personnel Image Recognized Problem Did Not Recognize Problem					
		18	23	37	22
Positive Management Function Image Recognized Problem Did Not Recognize Problem					
		42	33	17	8
Negative Management Function Image Recognized Problem Did Not Recognize Problem					
		32	30	26	12
Positive Communications Image Recognized Problem Did Not Recognize Problem					
		13	20	24	44
Negative Communications Image Recognized Problem Did Not Recognize Problem					
		13	26	33	28
Positive Personnel Image Recognized Problem Did Not Recognize Problem					
		45	30	17	8
Negative Personnel Image Recognized Problem Did Not Recognize Problem					
		30	32	27	11
Positive Management Function Image Recognized Problem Did Not Recognize Problem					
		6	25	24	45
Negative Management Function Image Recognized Problem Did Not Recognize Problem					
		13	14	42	31

Table 5.1 (cont.).

Management Problem in Transitional Range**	Percentage of responses in support/opposition to management programs				Total %	N
	Full Support	Conditional Support	Qualified Opposition	Full Opposition		
Positive Communications Image Recognized Problem Did Not Recognize Problem	49 35	32 30	19 21	0 14	100 100	37 89
Negative Communications Image Recognized Problem Did Not Recognize Problem	44 14	41 26	5 31	10 29	100 100	41 218
Positive Personnel Image Recognized Problem Did Not Recognize Problem	56 31	31 33	13 21	0 15	100 100	108 209
Negative Personnel Image Recognized Problem Problem Not Recognized	29 10	47 20	0 29	24 41	100 100	17 123
Positive Management Function Image Recognized Problem Did Not Recognize Problem	56 32	32 31	11 24	1 13	100 100	190 395
Negative Management Function Image Recognized Problem Did Not Recognize Problem	28 5	48 21	5 30	19 44	100 100	21 208

Table 5.2. (cont.)

Management Problem in Central Range***	Percentage of responses in support/opposition to management programs			
	Full Support	Conditional Support	Qualified Opposition	Full Opposition
				Total %
Positive Communications Image				
Recognized Problem	45	33	17	5
Did Not Recognize Problem	30	26	26	18
				100
				81
				46
Negative Communications Image				
Recognized Problem	30	34	25	11
Did Not Recognize Problem	6	20	30	44
				100
				141
				121
Positive Personnel Image				
Recognized Problem	48	33	16	3
Did Not Recognize Problem	25	29	23	23
				100
				220
				103
Negative Personnel Image				
Recognized Problem	16	39	27	18
Did Not Recognize Problem	9	11	25	35
				100
				62
				79
Positive Management Function Image				
Recognized Problem	48	33	17	2
Did Not Recognize Problem	28	26	24	22
				100
				390
				205
Negative Management Function Image				
Recognized Problem	16	33	27	24
Did Not Recognize Problem	4	16	28	52
				100
				95
				137

***Agricultural** = An underpopulation of deer in agricultural areas.

****Transitional = Habitat and commercial forest damage caused by overbrowsing in easy-access, privately-owned forested areas.**

***Central = An underutilized deer population in remote areas such as central Adirondacks and Tug Hill Plateau.

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APPENDICES

APPENDIX 5.1

Deer Population Management in New York:
Using Public Input to Meet Public Needs

Daniel J. Decker

Tommy L. Brown

George F. Mattfeld

1985

APPENDIX 5.2

**Agency Image: A Key to
Successful Natural Resource Management**

Daniel J. Decker

1985

AGENCY IMAGE: A KEY TO
SUCCESSFUL NATURAL RESOURCE MANAGEMENT

by

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A paper presented at the 42nd Northeast Fish and Wildlife Conference,
Hartford, CT, May 5-8, 1985.

AGENCY IMAGE: A KEY TO SUCCESSFUL NATURAL RESOURCE MANAGEMENT¹

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Abstract: Natural resource agencies operate in a socio-political atmosphere where agency image is a key factor in the success or failure of its programs. This paper presents an integration of extensive literature review on image-building and findings from six studies addressing various aspects of the image of the New York State Department of Environmental Conservation. Three products are offered for agency consideration: (1) a conceptual model of 10 factors affecting a natural resource management agency's image; (2) descriptions of three traits of an agency, the perceptions of which by members of a public constitute their image of it; and (3) a five-step image-building process for an agency. Additionally, insights into relationships between a public's image of an agency and support for its programs are provided.

Natural resource agencies, like corporations and nonprofit organizations, operate in a socio-political environment where their public image is a key factor in the success or failure of their programs. For better or worse, whether an agency chooses to do something about it or not, every natural resource agency has a public image -- perhaps several.

An image is the stereotypic impression people have of an agency, particularly their perceptions of and beliefs and attitudes about an agency's personnel, management functions, and communication behaviors (these will be discussed in more detail later). Every individual has a slightly different image of an agency, and images can change over time. These images are not necessarily based on "facts" as we might think of them; images are based on people's beliefs, which serve as their facts about the agency. Knowledge of the images key publics have of an agency is essential to communicate with them effectively.

The need to improve communication between wildlife managers and their publics is widely acknowledged (e.g., Robinson and Bolen 1984, Schoenfeld and Griffin 1981), and natural resource managers have long recognized the importance of developing and maintaining a favorable image with key publics (Decker 1976a,b). Gilbert (1971) and, more recently, Fazio and Gilbert (1981) have provided managers with useful references to the public relations and communication aspects of natural resource management, but problems persist. The perennial deer management dilemma in Northern New York (Decker et al. 1983, 1985b), the recent Maine moose-hunting controversy, and the current dove-hunting issue in New York are all reminders of both the

¹A contribution of New York Federal Aid for Wildlife Restoration Projects W-145-R and W-146-R.

historic and contemporary public image problems associated with wildlife management. Basically, wildlife management agencies have two image-related needs: (1) remedies for undeserved public perceptions which create poor images and (2) remedies for poor agency traits which are correctly perceived by publics and create poor (but deserved) images.

Other natural resource professions are equally concerned about their image. In a recent issue of the Journal of Forestry, Hendee (1984:342) warned foresters that, "Public sentiment must be recognized and respected. Any forestry policy that runs counter to pro-environment opinion risks becoming a public problem, damaging the profession's credibility and reducing the latitude accorded forestry by the public." Hendee (1984:343) also advised that, "Public opinion deals more in images than in facts..." These observations apply to fish and wildlife management professions, as well.

The purpose of this paper is not to reiterate at length the concepts of public relations and communication covered so well by Fazio and Gilbert (1981) and others. Rather, some of the image-related and communication-related findings from studies conducted for the New York State Department of Environmental Conservation (NYSDEC) by Cornell University will be presented. Based on review of image-building literature and six studies addressing DEC's image over the past 10 years we have developed three "products" that should be useful to the image considerations of any natural resource management agency. These products are: (1) a conceptual model of 10 factors affecting an agency's image that can be used in analyzing or planning agency image development; (2) descriptions of three dimensions of an agency's image (personnel, management functions, and communication behaviors) that our studies indicate are the major traits of an agency recognized by the public, and (3) a five-step image-building process that an agency can follow for image formation. Unlike many papers on this topic, the influence of agency image on public support for agency programs is documented, accentuating the importance of an image-building program for an agency.

I would like to acknowledge the technical assistance of Nancy Connelly and Martha Link in preparation of this paper; the critical review of concepts by Tommy Brown, Ben Peyton, Ken Purdy, and Robert Smolka; and the insight into agency use of study findings provided over the years by George Mattfeld and Stuart Free, NYSDEC.

METHODS

This paper is a summary of several studies conducted in New York. The specific methods and results of these can be found in the publications cited. Consequently, in the interest of brevity, I will not present sample sizes, response rates, etc., for each study cited herein. These details are not essential to the purpose of the paper.

RESULTS AND DISCUSSION

Terminology and Key Concepts

A public is an identifiable group of people with a common interest. An individual may belong to several publics. A natural resource agency's publics often differ in relation to its different programs (Giles 1978) and some are shared with other, related agencies and organizations (Gilbert 1971). Communication with each key public should be designed with its particular characteristics in mind, especially values and attitudes relative to natural resources management (Fazio and Gilbert 1981).

There are two basic classifications of publics — internal and external. Internal publics are comprised of individuals within the organization whereas external publics are comprised of people outside the organization (Fazio and Gilbert 1981).

Public relations is a process of two-way communication between organizations and individual publics (Gilbert 1971), the goal of which is the favorable influencing of public opinion (Fazio and Gilbert 1981). It is the activity of creating and maintaining understanding between an organization and its publics, with this understanding being based upon good performance by the organization and upon adequate communication so that the performance obtains favorable public recognition (Decker 1976b). The public relations specialist's job is communicating good performance and factual information so the agency receives favorable public recognition and maintains a consistent, favorable image among key publics. But seldom are there such specialists in a natural resource agency; rather, everyone in an organization has public relations responsibilities (Saults 1962, Hyatt 1969, Fazio and Gilbert 1981). Their success in dealing with these responsibilities affects their agency's image and the public opinion atmosphere in which they work.

A quick review of seven principles of public relations offered by Fazio and Gilbert (1981:33-40) will set the tone for the remainder of this paper:

- Principle 1 - Every action makes an impression.
- Principle 2 - Good public relations is a prerequisite of success.
- Principle 3 - The public is actually many publics.
- Principle 4 - Truth and honesty are essential.
- Principle 5 - Offense is more effective than defense.
- Principle 6 - Communication is the key to good public relations.
- Principle 7 - Planning is essential.

Although this paper will touch upon aspects of all of these principles, of particular interest is Principle 6 because the thrust of our studies have been in the context of communication planning by DEC.

The Conceptual Model

A conceptual model of factors affecting the image of a natural resource agency was developed as a result of an exploratory image study conducted for the Bureau of Wildlife, NYSDEC (Brown and Decker 1976, Decker 1976a,b). The model should be viewed in light of the following:

- 1) It is often easiest to deal with the image of one major program area (e.g., Bureau of Wildlife) rather than the image of an entire, multifaceted agency (e.g., Department of Environmental Conservation); however, the interrelatedness of public perceptions of all agency divisions and people's tendency to lump these impressions into one category should not be ignored.
- 2) Image research and any subsequent measures taken to improve an image should be directed at key publics, considering each uniquely, but dealing with all in a comprehensive effort (i.e., the basic content of messages should be designed to be consistent, even though the particular language or slant of communication may differ from one public to another).
- 3) Relationships between an agency and a public regarding a certain program do not occur in a vacuum. Other programs of the agency, other related agencies, and other publics interact and serve to confound the picture. All these interactions are important and the most salient should be considered.

The 10 factors in the model (Fig. 1) may aid in the diagnosis of likely problem areas for a currently unfavorable image situation. Ideally, the model should be used as a planning guide when analyzing the image ramifications of any potentially controversial management or policy decision.

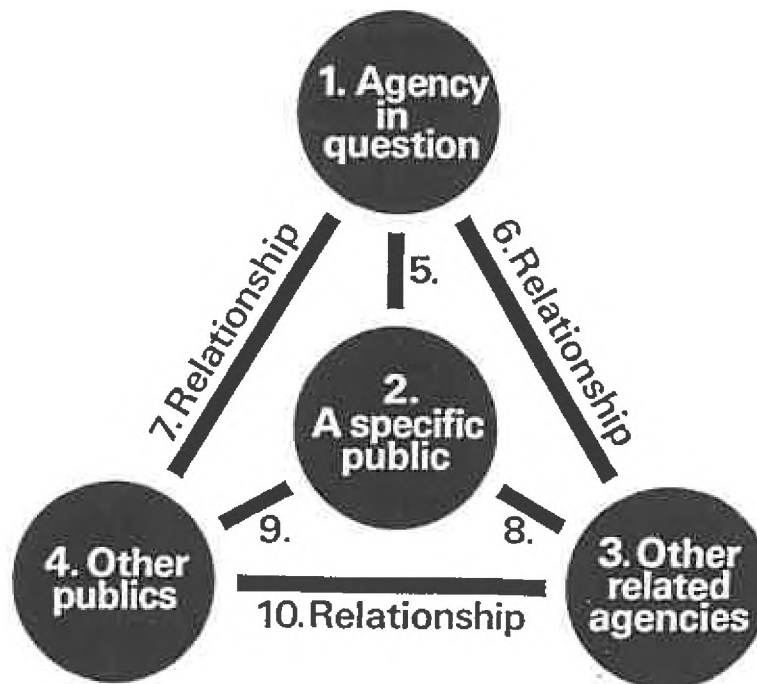


Figure 1. The ten key factors affecting the image of a natural resource management agency.

The first four factors relate to the characteristics of the agencies and publics involved. The 1st factor is the set of agency characteristics (real or perceived) relative to its personnel, management function and internal communication harmony. The personnel characteristics of concern include: personal presentation management, competence, credibility, attitudes toward job, and attitudes toward external and internal publics. Characteristics of an agency's management function that are of concern include the nature of management programs, regulatory responsibilities, research and policies. Internal communication to maintain esprit de corps is also an important characteristic of an agency. Good internal communication is required of an agency before good external communication can be expected, because every individual in an agency is a spokesperson for it.

The 2nd factor encompasses the characteristics of a particular external public (i.e., the referent public of concern), including socio-demographic and communication-relevant characteristics as well as attitudes toward the agency. The characteristics in factors 1 and 2 apply similarly to factors 3 (the characteristics of other related agencies) and 4 (other publics' characteristics), respectively. The remaining six factors are concerned with the relationships between the above-mentioned groups and relate primarily to communication. Communication behaviors include those of individual agency employees at all levels and the broader communication strategies of the agency.

Factor 5, the agency's relationship with and communication behaviors toward the referent public may be the most important factor in the image-formation process because, regardless of the agency's or public's characteristics, if the 2 groups do not interact meaningfully and positively their characteristics are irrelevant to image building.

The 6th factor is interagency relationships, the favorableness of which, like good internal communication, are essential to the success of a program. Communication with related agencies about a particular program of mutual interest should occur prior to its external exposure. The 7th factor is the agency's relationships with other publics that might interact, communicate, and otherwise influence the referent public's image of the agency or its program. Factors 8, 9, and 10 are relationships of concern and importance, but typically out of the direct influence of the agency. Natural resource managers can strive to be aware of these relationships and to influence them indirectly by maintaining favorable communication between their agency and the other groups (i.e., factors 5, 6, and 7). In some instances (when "related agency" is another division within the same superagency) factor 8 is manageable if the superordinate agency administrators agree that division-division cooperation and coordination should and will occur. Also, in some situations factor 9 is controllable; in matters of resource allocation (public-public conflict) the agency can and should be involved as a facilitator (vs. arbitrator).

The high degree of interaction between the 10 factors is apparent. While these relationships indicate the complexity of the image-formation process, they also point out one critical fact -- nearly any act of an agency or of its personnel may have implications for at least one, and possibly many factors affecting its image.

Public Perception of Image Traits

The two factors over which the agency has the most control are the perceived characteristics of the agency and the relationship (i.e., communication) between the agency and the referent public. An exploratory study was conducted for the Bureau of Wildlife, NYSDEC, to improve the Bureau's understanding of these factors relative to the deer management program in Northern New York (Decker 1976a,b). This study pointed out the importance of internal communication between major divisions of the agency (essentially, the divisions within NYSDEC can be thought of as separate agencies within our conceptual model) on the Bureau's image among key publics. Often representatives of these other divisions neither understood nor agreed with the Bureau of Wildlife's position regarding deer management. These people commonly were respected in their communities, were sought by others for their opinions on deer management, and were willing to express their opinions publicly. Obviously, this could be a situation detrimental to the Bureau's effort to develop management credibility in the region. The fundamental problem expressed by members of related divisions was the Bureau of Wildlife's lack of communication with them. Since the study in the mid-70s, several steps have been taken by NYSDEC to improve internal communication and enhance overall rapport between staff of the agency's divisions working in Northern New York.

This exploratory study also found that people's image of an agency was based largely on their perceptions of three agency traits -- personnel, management function, and communication behavior. A scale of opinion statements was developed to measure public perceptions of these traits (Brown and Decker 1976). A modified scale has been used in three recent studies serving program planning and policy development in specific management areas. The findings from these studies provide insights into the relative importance of public perceptions of these traits of an agency's image vis a vis support for programs.

For example, in 1983 a study of deer hunters in Northern New York was conducted to determine their opinions about deer management in the region (Decker et al. 1983). Using the image scale, we found that half of the deer hunters had no opinion of the qualifications of NYSDEC's deer management personnel. They were split relatively evenly between being positive, negative or having no opinion of NYSDEC's deer management program. However, nearly half of these hunters felt that NYSDEC was not communicating well with them and was not listening to their views. This documented the extent of hunters' perception of insufficient two-way communication between them and NYSDEC, a situation needing improvement if the agency hopes to improve its image with this important public. NYSDEC is addressing this situation in a forthright manner, feeding back information about their program, and even results of the hunter study itself, in a variety of ways.

Two studies have been conducted with leaders of a variety of organizations having interest in deer in Northern New York to assess NYSDEC's image regarding its deer management program (Brown and Decker 1976, Smolka et al. 1985). Although the studies were separated by nine years, the results were very similar. Organization leaders' opinions of NYSDEC's (1) management program and (2) personnel were generally positive; while opinions of (3) communication behavior were most often negative. Thus, the last

image trait, communication behavior, again seemed to be in the greatest need of improvement.

Image and Agency Support

Knowing that people distinguish between traits of an agency's image and determining which traits are in greatest need of improvement should be useful in targeting efforts to improve that image. But a fundamental assumption in this thesis has not yet been demonstrated; i.e., a positive relationship exists between an agency's image and support for its programs. Data from three studies in New York indicate that such a relationship indeed exists (Table 1). In every study, people with a positive overall image of NYSDEC were more likely to unconditionally support than to oppose the agency's management efforts unconditionally. People with a generally negative image either showed no tendency toward extreme support or extreme opposition positions, or were more likely to oppose than support the agency's management efforts, depending on the audience studied. These trends usually held for each of the 3 particular image traits, as well.

Characteristics of a Public

The concept of a public is not unfamiliar to those of us in natural resource management. Traditionally we have been taught to equate publics with organizations or groups of resource users, such as bowhunters, flyfishermen, or birders. These are logical groupings from the standpoint of reaching a particular group with a message -- organizations have mailing lists and people who participate in the same activity often read the same publications or attend particular functions. But Fazio and Gilbert (1981) suggested a different approach to identify publics that relates better to how an agency might structure messages than to channels for delivering them. They suggested that publics should be defined based on similarity in attitudes and values about wildlife and its management.

Our research in this area indicates that such an approach has merit. Upon scrutiny of a variety of organizations' (New York affiliates) attitudes and values toward wildlife and its management, we have made some surprising discoveries. For example, Ducks Unlimited and Defenders of Wildlife were similar in their values regarding raptors, more so than either group was to The Nature Conservancy, Sierra Club, or Fund for Animals (Brown and Decker 1982). Other unanticipated attitudes and values similarities of communication importance have been uncovered. Over the course of five years we have developed a Wildlife Attitudes and Values Scale (WAVS) to measure an individual's attitudes and values toward wildlife. It has been used in four studies and has consistently illustrated the existence of three dimensions to peoples' attitudes about wildlife: those relating to noneconomic/nonextractive use beliefs, those relating to economic/extractive use beliefs, and those relating to problem tolerance beliefs (adapted from Purdy et al. 1984). To illustrate the use of this wildlife attitudes and values information relative to profiling publics for communications planning, we developed a typology, based on dichotomizing responses to each of the three wildlife attitude dimensions as "high" or "low" (i.e., above or below the median scale value for the dimension), resulting in eight types that could occur from the possible combinations of "high" or "low" values for the dimensions. Applying this typology analysis to landowners in the Catskill

Table 1. Relationship between agency image and support/opposition for agency programs, by survey audience.

SURVEY AUDIENCE - Image Trait	Respondents with a positive image	Respondents with a negative image
	% support:% oppose	% oppose:% support
ORGANIZATION LEADERS		
- Personnel Characteristics	6:1	7:1
- Management Function	5:1	18:1
- Communication Behavior	10:1	3:1
Overall Image	8:1	4:1
NORTHERN NEW YORK DEER HUNTERS: (S. ZONE RESIDENTS)		
- Personnel Characteristics	3:1	3:1
- Management Function	5:1	3:1
- Communication Behavior	5:1	1:1
Overall Image	6:1	1:1
(N. ZONE RESIDENTS)		
- Personnel Characteristics	1:1	8:1
- Management Function	2:1	15:1
- Communication Behavior	1:1	3:1
Overall Image	2:1	4:1
CATSKILL REGION LANDOWNERS		
- Personnel Characteristics	5:1	2:1
- Management Function	9:1	1:1
- Communication Behavior	8:1	1:1
Overall Image	11:1	1:1

Region of southeastern New York, who had been surveyed to determine their attitudes about black bears and bear management in the region (Decker et al. 1985a), yielded an interesting finding relative to agency image. Among the five types with $n > 20$, the majority of landowners had no perception of the NYSDEC relative to bear management activity or management personnel, and only in one type did a majority have an opinion about NYSDEC communication behavior (Table 2). For those in a given type stating an opinion, the percent of positive responses always exceeded negative responses for the management and personnel traits, but the opposite was always true for communication behavior. Most important, while the three types most highly valuing black bears overwhelmingly reported favorable impressions of NYSDEC's management and personnel characteristics, by a 2-to-1 margin they consistently reported unfavorable impressions of NYSDEC's communication behavior. The importance of these findings is twofold: (a) communication behavior of NYSDEC relative to bear management was deficient from the standpoint of landowners, regardless of their value orientation regarding bears, and (b) the Catskill Region landowners are diverse in the ways they value bears and in their attitudes about bears, therefore efforts to communicate with these landowners need to consider this diversity, which essentially means treating landowners with different attitude/value orientations as different publics for communication purposes. For example, we know that over 90% of landowners highly regard noneconomic/nonextractive values of bears, that 63% highly regard both noneconomic/nonextractive and economic/extractive values of bears, that 58% highly regard both noneconomic/nonextractive and problem tolerance values of bears, and that 41% highly regard all three dimensions of the values of bears. Reviewing the particular value items comprising each of these dimensions may substantially aid NYSDEC in preparing communications about bear management in the Catskills.

Once an agency has insights such as those discussed above about their publics and agency image, it is in a position to take action for image improvement. The next section will outline the basic steps in the process to achieve an improved image.

The Five-Step Image-Building Process

Image-building is the process whereby an agency attempts to influence the future impressions and, ultimately, images of the agency held by a public. The process consists of situation analysis research, followed by improved agency performance, if necessary, and public relations/educational communication programs, resulting in favorable attitude change, on a public-by-public basis. Underlying the process is the overriding fact that an image will not change and endure if an agency does not make a continuing commitment to good performance, effective communication of such performance, and responsiveness to publics.

From a synthesis of the marketing, public relations, educational communication, and natural resources literature, the following steps were developed as a guide for image-building in natural resource management agencies. If an agency feels it lacks the expertise to carry out an image-building program effectively, consideration should be given to contracting for assistance or hiring a specialist for this purpose. The remainder of this section is adapted from Decker (1979).

Table 2. Agency image trait perceptions of Catskill Region landowners having various wildlife attitudes and values characteristics (i.e., types).^a

Wildlife Attitude Dimension ^b	Values for Each Dimension, Defining Type															
	(n=277)		(n=146)		(n=113)		(n=8)		(n=19)		(n=6)		(n=80)		(n=24)	
A:	Hi		Hi		Hi		Lo		Lo		Lo		Hi		Lo	
B:	Hi		Hi		Lo		Hi		Lo		Hi		Lo		Lo	
C:	Hi		Lo		Hi		Hi		Hi		Lo		Lo		Lo	
Image Trait	pos	neg	pos	neg	pos	neg	pos	neg	pos	neg	pos	neg	pos	neg	pos	neg
Management Function	31> 3		42> 6		18> 1		9>16		7> 3		12> 0		24> 5		17>16	
Personnel Character- istics	30> 6		41> 5		17> 2		12> 6		11> 3		8> 0		29> 3		19> 6	
Communica- tion Behavior	15<30		19<40		11<24		0<38		6<31		0<33		20<24		6<25	

^aNumbers reported are percents; the percents for the "don't know" category are not reported, for brevity, but can be calculated by subtracting the "positive" and "negative" percents from 100.

^bDimension Labels

A = noneconomic/nonextractive use

B = economic/extractive use

C = problem tolerance

Step One: Realize the need and make a commitment to meet it.

This initial step requires progressive and possibly major changes in administrative policy. A degree of courage is needed to agree to the self-analysis involved in image evaluation. If an agency's image is found to be unfavorable in some respects among particular publics, the agency's administrators should be prepared to start work immediately to improve the situation. If its image is favorable, the agency cannot afford to take a passive posture toward its public relations and image -- a laissez-faire approach will eventually spell trouble. In essence, a strategic plan for image-building should be outlined prior to image evaluation and any subsequent image-building effort.

Commitments of time and financial resources are necessary. Image-building takes time; therefore, patience is essential. Image research, program planning, implementation and evaluation also require adequate funding. Means to acquire this funding need to be developed in a way that ensures continuous funding. Satisfactory results cannot be expected if funding is cut halfway through an image-building program.

Step Two: Specifically identify what image is present and why.

An agency should know what image it has before making a decision about what image it wants. This requires situation analysis research to obtain information about publics and the image profile of the agency before beginning an image-building program. Information pertaining to the 10 key factors affecting an agency's image needs to be accumulated. Key internal and external publics should be identified. Their attitudes and images relevant to the agency should be determined as discussed earlier in this paper.

Step Three: Determine the image the agency desires.

This step requires agency administrators to make a decision regarding the image their agency should encourage. The decision should be a compromise, reflecting concern for both the agency's outlook and the attitudes and values held by the internal and external publics identified through image research. The target image then becomes the image-building program objective (Step Four). It is a factor to consider with every management or policy decision and every program or action concerning the agency. In effect, it acts as a self-image.

Step Four: Design a strategy for proceeding from the present image to the desired one.

This step requires carefully planned and executed public relations and educational communication programs. Public relations is not just publicity, especially for a public agency. Nor is it propaganda or any other questionable practice. Remember the simple definition of public relations -- credible performance duly recognized.

Performance means the agency has to correct real problems (internal and external) found to exist. Educational communication programs (internal and

external) may have to be implemented to solve real problems and overcome imaginary ones caused by ignorance or misunderstanding.

Recognition means that the desired image should be communicated effectively. Using the concepts of educational communication and public relations, people should be informed about the agency, its programs, and its personnel. This communication should help people to perceive the agency accurately.

Step Five: Evaluation.

The image-building process should be evaluated continuously. Evaluations should be made in light of the 10 key factors affecting the agency's image. After a predetermined time, another public image profile study should be conducted to evaluate objectively the progress being made toward public perception of the desired image. This should indicate where alterations in public relations, educational communication, and agency performance could be made. Make them and proceed.

CONCLUSION

The image of a natural resource management agency is a key element in the success or failure of its programs. The relationship between favorableness of that image, with regard to three traits -- personnel, management function, and, especially, communication behavior -- as perceived by a public, and the degree of support expressed for agency program has been documented. Agencies that purposefully seek to build and maintain a positive image are simultaneously seeking to reduce conflict and enhance communication for the benefit of natural resource management. Thus, image-building activities, particularly two-way communication, should be legitimate and high priority responsibilities for natural resource management agencies.

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APPENDIX 5.3

**Identifying and Relating Organized Publics to
Wildlife Management Issues: A Planning Study**

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1982

APPENDIX 5.4

**Social Determinants of Black Bear Management
for the Northern Catskill Mountains**

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1985